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TELEPHONE ENGINEER

VOLUME XXVI JANUARY, 1922 Number 1

Strowger Automatic and the Stockholder

Earning power and stability of return are the two prime considerations that a telephone company must promote in order to make its stock continually attractive to investors. There are various other considerations, such as good service and pleasant public relations, that help indirectly to attract capital, but the average investor is not usually disposed to consider these. It is sufficient for him to know that his money is safe and that it is bringing him a reasonable and constant profit.

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VOL. XXVI JANUARY, 1922 NUMBER 1

"Jim" Kelsey Comes Back!

"We Give Too Much Away" Says One of the Industry's Greatest Writers—Rate Cases the "Sport of Kings"—Reconstruction's Labor Pains—Life a la Party Line.

By J. C. Kelsey

J. C. Kelsey, known throughout the telephone industry as "Jim", has been engaged in telephone work since his graduation from the University of Kansas.

As employee and executive of operating companies, professor of telephony, sales representative, rate expert, and financier, his knowledge and innate ability have won for him a high standing in the business to which he has devoted his life.

For many years, Mr. Kelsey was in operating work, beginning as lineman, and working his way along by his achievements as Professor of Telephone Engineering at Purdue University, sales representative for the Kellogg Switchboard and Supply company. and by his "expert" work in many important rate cases in the United States and Canada.

In facility of expression, and in thorough acquaintance with his subject, Mr. Kelsey easily qualifies as one of the ablest and most interesting writers any industry can boast.

Beginning with this issue, Mr. Kelsey's articles will appear monthly in TELEPHONE ENGINEER.—Editor.

As I write I am on a west bound train.

A comfortable train, on a railway apparently with a soul.

There is something different about the Santa Fe, whose trains glide smoothly in and out of its terminals, guided by engineers who seem to love their fellow man.

Some railroads have a different spirit, and passengers have their necks cracked, and jarred by engineers who seem to be sore and angry at someone.

Think of it, the only sin the passenger is guilty of, is paying 3.6 cents a mile, and a surcharge for the alleged comforts of a Pullman.

As some of my acquaintances know, the day before the government took over the telephones, something within me snapped and for weeks bordered on the realm of disordered fancy and physical paralysis.

J. C. KELSEY

One of the telephone industry's most brilliant writers and analysts, who begins a new series for TELEPHONE ENGINEER.

After a few months, I was able to navigate, as it were, and went to a Kansas farm, and thereby began to walk the pathway toward active life again.

After walking, came the necessity of working with my hands, and I spent one year at the bench with my old friend, Guy A. Joy, and began over my acquaintance with telephone apparatus and telephone men.

In a rebuilding shop there is romance and reminiscence, along with work, and in its atmosphere it may be, imagined that the spirits of Milo G. Kellogg and Alfred Stromberg fondly rove, never leaving in death what they gave themselves to in life.

And, also, the living Dean, Yaxley, Burns, Leich and Harris seem to be there. And, as well, the hopes and failures of men which must have been transmitted through the very transmitters and receivers which are

being sent out again to take part in the vital affairs of humans who must come and go with the passing years.

When I came back to life and activity, the government had strutted across the telephone stage, spoken its piece and was seen no more.

Private enterprise once more came into its own and with it came the pain and travail of reconstruction.

The world had been hopelessly drunk but, at last, morning had arrived and it reached for the ice pitcher.

And, even before this inebriated person quenched his thirst, there was a loud knock at the door. There stood the bill collector who had promptly arrived with a bill for the furniture, which had been so convivially and wholeheartedly destroyed.

The village blacksmith called for the sword, heated up his forge, and welded a plough share, which he gave to the world to begin its weary way back to normal.

It was a nice morning after.

The changes which have so visibly affected the world as a whole, have not missed a relative effect upon the individual.

The old spirit of economy seems to have lost its way, even its life, among the dead boys who lie so quietly now in those poppy fields.

Instead of thinking in thousands, as we should, we think in millions, and even billions.

Churches even took advantage of the psychology of the times and they began to raise hundreds of millions instead of millions.

Colleges, once content with a board fence around their athletic ground, now raise millions for stadiums, which rival those in which Spartacus defied the competing gladiators of Rome.

The Salvation Army found easy money and now asks for millions, where once the "War Cry" was sold and an occasional dollar caromed off the bass drum.

No more *day* coaches for anyone.

Speaking of day coaches, the world has surely trained itself to luxuries.

Not only such luxuries as silk shirts, Pullman coaches, extra fare trains and automobiles, but in the luxurious way of doing business.

A few years ago the pioneer settled his differences with his neighbor with his silver mounted rifle.

If a man stole a horse, all nature cried out for revenge until the horse thief swung in the moonlight from the convenient branches of a tree. He could not depend upon an expensive lawyer and a forgiving jury.

No lawyer got a fee; no court house was needed; and taxes were levied accordingly.

A few years ago, a telephone man raised his rates by calling upon his friends, and if he got into litigation about it, it was in his own courthouse and there was little relative expense.

Today, a telephone man with lawyers and auditors journey to his capitol city, there to unfold his troubles to a Commission.

It comes high.

I have in mind a typical rate case:

In front sit four commissioners, flanked by their auditors, engineers and reporters.

At the right of the commissioners sit five lawyers; two of them representing the City, one the Real Estate Board, one the Chamber of Commerce and another a League of Municipalities or some such protective organization.

With them sit two engineers, an assistant, an auditor and a telephone expert.

At the left of the commissioners sit five lawyers for the company, and with them sit the heads of the various departments of the company—six or more.

There are about four newspaper reporters present, as well, and possibly twenty or more spectators, all affected by the rate case in an economic sense.

Not only is the time used by this gathering a great expense factor but hotels and railways claim full share of the expenses.

A rate case is the Sport of Kings.

Years ago, I begged telephone men to get their house in order.

I called attention to the Greek candy man who refused to sell a nickel's worth of candy any longer; the bootblack who unblushingly raised the nickel shine to fifteen cents; the newspapers from one cent to two and three cents.

And in all industry the psychological moment had arrived when it was in style to raise prices.

Everybody had money, or thought they had, and increased rates and prices had no terrors for them at all.

It was a beautiful time for the telephone man who did not weaken; all he had to do was to set the wheel of higher income in motion and get it.

The government itself set the example in the railways and in every walk of life, and the poor foolish telephone man who did not swim with the tide had no reason to blame anyone but himself.

Today, that psychological hour has passed.

Men have awakened to the fact that the magic dollar, which seemingly filled their pockets only deceived them.

Increasing rents, increasing fare and increasing taxes have filled the heart with rage.

No wonder when a telephone company asks for a big increase at this time that trouble and opposition comes.

The public cannot understand why the farmer's products are down and the utilities' products are up.

And they refuse to be comforted.

The curious part of the telephone business lies in the public feeling about party-line telephones.

The public rides in a party-line street car; sits side-by-side with his neighbor and reads the paper in peace.

The public lives in apartments, which, after all is said and done, are party-line houses.

The people in the apartment use the same heat, the same janitor, the same roof and real estate.

They hear each other's footsteps, and curse each other's piano, phonograph or baby.

Yet, ask any one of these party-house people to have a party-line telephone, you have war.

A party-line telephone, equipped with harmonic or selective ringer, and only ringing when ringing is necessary, gives more exclusive service than any form of party-house, party-car, party-train or party-dining-room.

Yet at Dallas, Tex., 25,000 people had single-party telephone service, while at Kansas City 36,000 people out of 45,000 had, and demanded, single-party telephone service.

What does single-party telephone service mean?

First of all, it means a rate-increase, every year.

It means that every user of a telephone demands an excessive share of expensive real estate and buildings and the use of a greatly enlarged distribution system, as well as of switchboard facilities.

It means that the telephone company is driven to extremes to get money to keep up with service demands and to find space to give service to new users.

It means that the telephone company must appear before the Commission asking for higher telephone rates; not only because expenses are higher, but because investment is growing beyond reasonable limits.

The single-party-line user is asked to pay 8% on a $225 value, or $18 a year for interest alone.

It is not difficult to realize, with this added to operating costs, that a single-party residence telephone is going to cost close to $5.00 per month.

In Europe it was said only fools and Americans rode first-class.

To ride first-class in America means much more expense than in the other classes.

That is, the man who demands and gets a Pullman berth pays an excess charge for such service.

In all rate-making history, there never was anything more fair than the surcharge which the railways demand from Pullman passengers.

In day coaches, from 80 to 100 people ride in comfort, while the Pullman rarely has 32 people.

Look at the difference between the operating expenses of a Pullman service and a day coach.

And the telephone companies should take a leaf from the railway.

In other words, a single-party telephone should be subjected to a surcharge.

If a residence telephone with two parties on it costs $3.40 per month, the single-party subscriber should pay $1.40 per month surcharge of which the four-party subscriber be allowed $1.40, or a $2.00 rate.

The rising cost of telephone service presents the greatest danger to the telephone.

It has removed the telephone from its old cheapness and is threatening to make the service prohibitive to the poorer classes, especially since the adjustement period.

The moment the telephone business cuts itself from this foundation, its real troubles will begin.

Every subscriber in any city could have a $2.00 per month telephone—New York, Chicago or Bonner Springs—but that telephone must be on a party-line basis, whether four or eight parties, according to economic conditions.

By giving such a rate for such a service the commissions, city governments and telephone companies have done their duty.

If the people will not take the lower rate, with its lower investment, then let them pay for it.

In other words, no user of a single-party-line telephone is entitled to mercy.

A Texas city has 20,000 telephones. It has over 20,000 switchboard lines and a distribution system for 30,000 subscriber lines.

Yet the people of that city are demanding more telephone service and the company is going to buy new land, build a new office, buy a new switchboard and rearrange its distribution system.

What an economic monstrosity!

There are, already, enough buildings and switchboards as well as distribution to connect up 60,000 telephones, and with perfect service conditions, too.

The company is realizing the need of a higher rate, and nobody in existence can or will deny them one.

It stands to reason that this single-party-line telephone system is as wasteful as if a large apartment building had but one family in it.

And it also stands to reason that if 60,000 telephones used these existing switchboards, it would give the company a chance to make a dollar.

I can't help but think of Judge Simpson's wonderful speech at the Chicago convention, November 16th.

In it he calls attenion to one of the greatest weaknesses of business: the withdrawal of the business heads from the firing line.

Instead of leaving clerks to handle public relations, the owners should do it themselves.

No man makes a greater mistake than to think he is too big to know his humblest salesman or employee.

Judge Simpson also called attention to the disgraceful practice of some telephone men laying the blame of higher rates upon the Public Service Commission.

Why should a telephone man be ashamed of asking a higher rate when his expenses have gone up?

Why should he apologize and why should he give an impression that is not ringing true as he states his case?

Why should any patron of a telephone company not pay for every item of service he demands?

Too many of us have failed to charge for this service, and that is why we have to ask for a high maximum rate.

Moral: We give too much away.

Gary Heads Missouri's Multi-Million Dollar Road Staff.

Jefferson City, Mo.—Theodore Gary, one of the foremost figures in the telephone industry, has been appointed by Governor Hyde as chairman of the Missouri State Highway commission which is to spend $100,000,000 or more for road building in this state. Mr. Gary is not without successful experience in this work as one of his first achievements in semi-political life was the supervision of road construction near Macon, Mo., where he built his first telephone plant. His extensive interests in the telephone industry received considerable mention in the numerous favorable newspaper stories recording Mr. Gary's appointment to the leadership of the highway board.

Commission Marks Lima, Ohio, Among Country's Premier Utilities.

Lima, O.—Recognition of the Lima T. & T. company as one of the nation's best has been granted by the state public utility commission in allowing the company a 12 per cent rate increase. The commission finds no immediate or near future opportunity for reducing expenses and maintaining Lima's present high standard of service. Its decision also justifies the rate as a reward for the service.

No "Expert" Local Service At New York State Expense.

Albany, N. Y.—The State Conference of Mayors has been informed by the Public Service commission that the state's experts will not be furnished to the municipalities individually during the investigation of the New York Telephone company. Absence of legal warrant is the reason set forth.

Ardmore, Okla., To Get New Phone Plant.

Ardmore, Okla.—A new plant and construction work amounting to $103,000 has been alloted to Ardmore by the Southwestern Bell Telephone company.

Three State Meets Open 1922

Up-State New York, Pennsylvania, and Minnesota to Have January Meetings That Will Blast New Year Wide Open—All Promise Epochal Conventions

This year of grace 1922 will get off to a running start in the telephone industry.

That much is certain from a glance at the plans of three important state associations which plan to hold their annual conventions in January.

The first annual convention of the Up-State Telephone association of New York will be held at the Hampton Hotel, Albany, on January 18th and 19th. This meeting will be watched with more than usual interest due to the fact that, for the first time in 15 years there has been formed a successor to the old New York State Telephone association.

In addition to the New York Telephone company there are 310 separate telephone companies in the state, operating 563 exchanges, and serving about 250,000 subscribers' stations. Nearly all of these companies are members of the new association.

Membership in the Up-state association is open to all telephone companies, regardless of their affiliations.

J. G. Ihmsen is vice president and general manager of the organization, and due to his able activities a big attendance of company representatives and manufacturers is forecast for the Albany pow-wow. Non-member companies also have been invited to attend the association's sessions.

Exhibits of the leading manufacturers are assured. The summary of the up-state situation presented by Mr. Ihmsen to manufacturers got an immediate and big response. In presenting the association's invitation to manufacturers, Mr. Ihmsen said, in part:

"For many years New York state has been regarded as a territory, almost entirely dominated by Bell interests; and for that reason a great many producers and dealers in telephone apparatus and supplies have practically abandoned or at least curtailed their activities in this section.

"Influential forces have been at work for several years in the interest of harmony, which has resulted in bringing about a very satisfactory situation, one of distinct advantage to the independent manufacturers of telephone equipment and supplies, as well as to the locally owned operating companies.

"The benefits that have accrued to the industry as a whole include amongst others, almost complete elimination of disastrous competition between telephone operating companies.

"This has been brought about by the sale or exchange of properties between the Bell and independents so that the company having the preponderance of business would retain undisputed possession of the territory; also by the allotment of operating zones, contiguous and tributary to the exchange area; also by prohibition against the invasion of each other's territory.

"The former adversary attitude of the Bell system towards the locally owned exchange, has been changed to one of friendliness and helpful cooperation. Coincidentally it has been made very definite that they do not wish to buy any more telephone properties in New York state.

"Heretofore the maintenance and replacements have been neglected in many local plants, because there has always been the hope of selling out; but now that there is no longer a prospective buyer, the local properties must be rehabilitated and maintained, in order to make some return to the local stock holders.

"This evolution of the telephone situation has brought about a perfectly serene and happy condition which enables the telephone company to buy new equipment with the money that was formerly used to fight competition, so that there is no place in the world where there is a better opportunity to sell telephone goods than right here in New York state."

Officers of the Up-State Telephone association of New York are, Geo. R. Fuller, Rochester, president; G. G. W. Green, Johnstown, secretary; F. J. Brookman, Rochester, assistant secretary; Chas. Beattie, Rochester, treasurer; J. G. Ihmsen, Albany, general manager. Vice presidents are, B. H. Shepard, Syracuse; J. H. Wright, Jamestown; C. M. Smith, Perry; H. P. McDonough, Newark; G. G. W. Green, Johnstown; F. D. Fancher, Middletown; J. P. Boylan, Plattsburg; H. W. Fluhrer, Oneonta; F. S. Rodenhurst, Clayton; and J. G. Ihmsen, Albany.

On January 12th, 13th, and 14th, at the Penn-Harris Hotel, Harrisburg, Pa., the Pennsylvania State Telephone and Traffic association will hold one of its justly famed annual meetings.

President H. E. Bradley makes an announcement of a program that gives the flavor of a national convention's practical and valuable nature. He also gives advance notice of manufacturers' exhibits that will be magnets, and prophecies that every salesman who wears his O'Sullivan's lopsided in Pennsylvania will answer "present" in clarion tones when the roll is called up yonder in the Pennsylvania capital.

Mr. Bradley says:

"Following our desire to make this a real convention for telephone men we have arranged a programme of subjects which will prove most interesting. "Telephone Accounting," "Methods of Collecting," "Increasing the Revenue," "Keeping Down the Expense," "Advertising," "Depreciation" and "Insurance at Cost," are all subjects having a vital bearing upon the business just at this time. Mr. Stockwell of the Keystone Telephone company of Philadelphia will read a paper on the change to automatic in Philadelphia. In addition there will be interesting addresses by President MacKinnon of the National Association and Chairman Ainey of the Public Service commission. Many officials of other state associations will be present to tell us of conditions in the surrounding states.

"The manufacturers' exhibits will be more interesting than ever before. Features will be: "The Kellogg Switchboard and Supply company, with their Feature Board," and "Tommy" Thompson; Stromberg-Carlson Telephone Manufacturing company with something new in equipment for the smaller companies shown by Rube Davis; Automatic Electric company, with automatic board and switches and "The Dial of Destiny;" Cook Electric company with protective devices and terminals; French Battery and Carbon company, with a full line of batteries and Frank Eldridge; Re-

liable Electric company will exhibit "Reliable products" and George Rodoromer. Smith & Hemenway company will show a line of "Red Devil" tools; National Carbon company with "Columbia Batteries." One or two others are negotiating for space."

Minnesota Plans Winner.

E. C. Kast, secretary-treasurer of the Minnesota Telephone association is busy planning for that organization's annual meeting which is to be held at the West Hotel, Minneapolis, January 24th, 25th, and 26th. Topics to be brought before the clinic of Minnesota's best telephone talent cover a variety of subjects.

A survey of the Minnesota association's executive roster shows the meeting is sure to be full of pep, high purposes and practical value. H. E. Leuders of Norwood heads the organization. Vice presidents are E. P. Wright, Alexandria, and W. S. Clay, Hutchinson. E. C. Kast of Minneapolis is secretary-treasurer. Directors are: Thos. Vollom, Erskine; P. M. Ferguson, Mankato; Jay Greaves, Glencoe; D. W. Gretorex, Blue Earth; F. D. Lindquist, Fulda; D. M. Neill, Red Wing; Irving Tood, Jr., Hastings.

Thompson-Levering Company in New Plant.

Philadelphia, Pa. — Starting business in a small way in 1909 on the second floor of a building on Arch St., Philadelphia, the Thompson-Levering Co. steadily outgrew each additional space acquired until it became necessary to build a plant of their own. Having acquired an excellent location some few years ago at 57th street and Westminster Ave., the plant was built this summer and transfer of departments entirely consumated the 1st of November. With a modern building, light on all four sides, and providing adequate space for future growth, the company feels it can handle its steadily growing output efficiently. On the ground floor are rooms specially equipped for tool making, storing stock, packing and lacquering under special fire proof construction; also the machine shop and general shops. The heating plant is in a cellar under part of the ground floor. On the second floor are the general and private offices, coils winding department, galvanometer department, assembly room, general laboratory and Chief Engineer Vawter's office and research laboratory; all arranged as careful study and years of experience dictate.

A small hospital room and other necessary rooms for the comfort and care of employees provide ideal working conditions and every one is enthusiastic in their new home.

The New Home Thompson-Levering now Occupies in Philadelphia.

GIRLS' CHAMPION.

Newspaper Special Writer Sets Public Right on Subject of Telephone Girl.

Vancouver, B. C.—Al. Hardy, a feature writer on the staff of the Vancouver Sun takes up the cause of the telephone girl against all comers. They have no mean champion in Hardy. In the days when knights were bold no more earnest nor glowing tribute was paid to a fair damsel than the chivalrous Hardy pounds out, inspired by the action of British Columbian telephone girls.

He writes:

"In changing dramas in which idols are shattered and heroes are born in one brief moment, there is one figure that continues to be featured—the ordinary telephone girl.

"The recent cataclysm at Britannia and the floods at Port Coquitlam have in each instance again demonstrated that fact with traditional emphasis.

"Telephone girls have been much maligned by fiction writers or irresposible punsters.

"To the man in the street she has been catalogued as 'a gum-chewing, talkative, ungrammatical and flippant 'kidder,' whose chief amusement in life is to mix up 'calls' and 'josh' the bell-hops.

"No conception of any class of worker could be more distorted. On the contrary, the telephone girl is accurate, efficient and trustworthy to a degree that might well be taken by society at large.

"The fact that these girls always arise to an emergency, which often saves the lives of many persons at great peril to their own, proves that they appreciate their responsibilities at all times.

"They are alert and have learned to keep their wits about them under an avalanche of abuse, censure, silly questions from stupid units of the public, advances by mashers and would-be humorists, and other trials that handicap them in their duties.

"The uniformity of telephone girls' actions and heroic deeds in times of stress makes their record an outstanding chapter in the progress of humanity.

"These recent cases are not outstanding, for they are what might be expected from the heroines that serve the public; but they are fitting examples of the high type of humanity that the 'hello girl' fraternity enjoys.

"'Let those who so desire sound praises to the heroes of war; to the lifeguards that patrol the rocky coasts as protection to the ship-wrecked mariners; or to the intrepid birdmen who defy the elements in their attempts to fly the ocean; my eulogies are to the 'phone girls—the most consistent heroes, or heroines if you wish, that emergencies reveal."

OPINIONS AND COMMENTS

THE LOUD SPEAKER.

Telephone companies are hearing considerable about the Bell's loud speaker, which has proved such a sensational feature of many recent public meetings.

There is another loud speaker that holds brilliant promises for the telephone industry, and that is newspaper publicity. The telephone industry can speak its piece to the entire community through its newspapers.

Utmost attention should be given to the message. A great part of a telephone company's efforts to make more money are matters of news, and in companies where this fact is appreciated newspapers carry plenty of news items favorable to the utility.

Fort Wayne's manager, Bohn, Builta of the Northwestern Bell, the New England and Southwestern Bell publicity departments are especially active in their work with newspaper reporters and editors. This is work that pays and pays well. It is not a task that involves any extensive technical training in newspaper or advertising work, so it is well within the capabilities of the manager of smaller telephone companies.

CONVENTIONS.

This year opens strong with sectional telephone conventions. From inspection of the programs of these affairs it is evident that the telephone man who doesn't attend is going to be out some money.

But all the good of a convention does not lie in the set program. Many a telephone man has attended a convention and received from the scores of friendly, informal group sessions, "inside" information that he could apply to his own property with great profit.

If a man can't make a living in 51 weeks, he has slim chances of making the grade in 52. So the idea that the time for convention attendance can't be spared is one that won't hold water.

NO BACK TALK.

"The telephone pole seldom hits the automobile," says the Financial American, and thereby causes us to wonder if the owner of the telephone pole wouldn't do well to adopt a policy of doing more hitting back. A staunch defense and a justifiable offense are two good big factors in winning public respect and admiration.

PROF. R. V. ACHATZ
Now Technical Editor of TELEPHONE ENGINEER

We are pleased to announce that Professor R. V. Achatz, head of the telephone engineering department at Purdue University, becomes technical editor of Telephone Engineer, effective with our next issue. Prof. Achatz (pronounced Ok'otz) is one of the best known and most popular authorities of the telephone industry. His education, experience and occupation make him the ideal man for technical editor of a good telephone engineering journal. We are sure his accession to our staff will prove a source of lasting pleasure and benefit to the telephone business.

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ADVERTISING

TELEPHONE ENGINEER is issued the 15th of each month. Copy can be accepted as late as the 8th of the month preceding date of publication. Where proof must be seen, allow ample time for transmission in the mails. Display Advertising—Rates on application. Classified Advertising—"Wants," "For Sales," etc.—$4 an inch, or 7 cents a word per insertion.

"PULLMAN TRAFFIC."

To get a message across to the public there is no rhetorical device as valuable as an apt comparison.

The parables of the scriptures, Aesop's fables, and Lincoln's stories are a few widely scattered instances of the effectiveness of the inimate parallel.

Now comes a simile that promises a great help to telephone companies in rate cases. It is the Kelsey comparison of private line telephone service with Pullman travel. The public expects to pay a premium when it travels by Pullman instead of by day-coach, but it puts up a loud and heated howl when it is asked to pay a premium for a more costly form of telephone communication.

In a case recently won by a telephone company this comparison was used to excellent advantage. Even the newspapers that hauled up their heaviest guns to shoot holes in the decision were unable to find any flaws in the application.

This is a good thing to bear in mind in rate case publicity. Headline a comparison that convinces the public. It's a surefire way of convincing doubters.

1922'S REWARD.

It was said that 1921 would reward fighters. That made a red-hot slogan. For this year how about "1922 will reward survivors"?

Those who survived 1921 are in fighting trim. Every faculty is keenly trained.

The worst has been passed. It taught many costly and valuable lessons that will be applied in making this year a great one for the survivors in the telephone industry.

Feeling the Pulse of Trade

How the Traffic Curve Registers Each Important Event—Local and Distant Significance Revealed by the Telephone Company's Unfailing Barometer

"Every little movement has a meaning all its own!"

When Madame Sherry warbled these catchy words, serious things like tl telephone and mundane business no doubt were very, very far from her thoughts. But if Madame Sherry had had a serious turn of mind it is likely she would have seen the relation—especially so, if she had been a telephone traffic engineer.

It has been remarked by persons scientific that the most delicate instruments ever devised by human mind is the seismograph. This frail thing records the nervousness of old Mother Earth. Whenever the old mother shakes a bit somewhere in her weather-beaten frame, the faithful seismograph carefully jots down the tremor, no matter how faint the earthquake, or how distant. The jiggling needle of the seismograph catches and records her every "little movement" for the edification of minds scientific or editorial.

In our own business we have a seismograph of our own. It is just as delicate and responsive as the seismograph, but instead of recording earthquakes it keeps an accurate, reliable record of telephone traffic. It is known as the traffic curve. Every business flurry, every fire, every automobile accident, every time Johnny gets ill enough for a doctor, the old reliable traffic curve records the fact. Of course this is only generally speaking. It takes considerable of a business flurry, or considerable of a fire, or considerable of an automobile accident to make much of a showing on the traffic curve; but if one reads closely enough all these things may be read therein.

To illustrate how responsive the traffic curve is to "every little movement" several exaggerated cases have been chosen, because the exaggeration, though true, is bolder.

Take a glance at Chart No. 1. This si a toll traffic chart for outgoing tolls at El Dorado, Arkansas, in 1919, 1920 and part of 1921. It is noted that during 1919 and 1920 the outgoing toll calls per day ranged from as high as 175 to as low as 75 a day. Those figures to the left of the chart indicate that the outgoing calls per day, and you read from them across the chart lines to the curve. By reading from the date lines, at the bottom of the chart, up to the curve and then across to the number of calls, you can see just how heavy the outgoing toll traffic was at El Dorado for any time in the period covered by the chart.

Now notice how after two years of a fairly consistent amount of traffic, business suddenly mounted in January, 1921. In a month it leaped from 125 outgoing calls a day to more than 350 outgoing calls a day. Then it slumped a bit, after which it steadily climbed to about 475 calls a day. Then it fell off a bit and was still on the decline at the time the curve stops.

But what happened in El Dorado to send the toll traffic curve skyward? Think! Don't you recall that a big oil gusher was brought in near the beginning of 1921? Sure you do. Well, that's the answer. Over night, it seemed to the toll operators in El Dorado, that the whole world had suddenly gone into the oil business, with the long distance as the sole means of transacting that business. There were calls for drilling machinery, there were calls by newspaper correspondents to their newspapers, there were calls by landowners who wanted to buy or sell oil leases. And long distance had to work overtime. That's why the "telephone seismograph" shot upward. It was faithfully recording another one of those "every little movements."

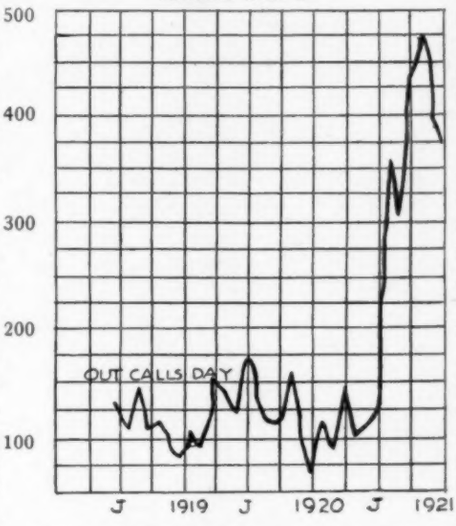
And what was happening while the curve was skyward bound? Traffic men, and plant men, and commercial men were on the job. Reserve switchboard facilities were rushed to the El Dorado to relieve the congestion, and commercial men were looking over the field to ascertain how lasting the growth was and what permanent facilities were needed to provide adequate service. And in the meantime the old traffic curve just kept on curving. It reached a peak—that is, its highest point—and then began to drop. Had the oil given out, and was the boom over? Was that the story the curve told? Hardly. Rather, the demand for oil slackened. It fell off to the point where already developed fields had a surplus supply of oil. There was no need to further develop the new field. So drilling operations fell off, and with it also fell off toll traffic, and as traffic fell the curve also fell.

Now look at Chart No. 2 for further initiation into the mysteries of the traffic curve. This chart represents the outgoing toll calls per week at Dallas in 1921. The curve runs fairly even to August, then it leaps upward from about 12,250 calls a week to 15,000 calls a week. Dallas is a big cotton marketing center; and a large portion of the cotton raised in Texas

Seldom is the intimate necessity of the telephone shown so convincingly as it has been in the accompanying story from the Southwestern Telephone News. Each movement that affects business is registered on the traffic curve so the close student may discover the cause, and forecast service demands that may result from future changes.

The article has a strong public interest, and adapted to local conditions, is almost certain of big space in local newspapers.

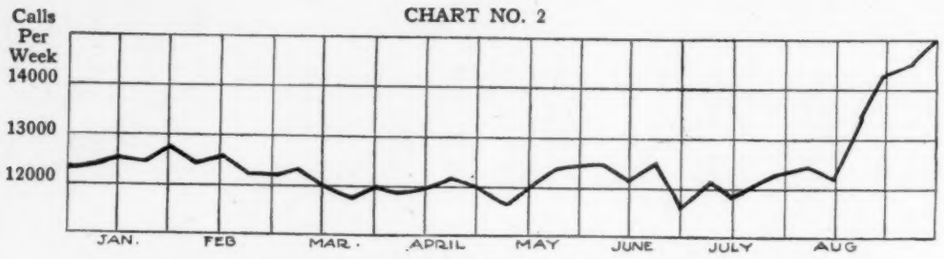
CHART NO. 1



Notice the Traffic Curve Shoot up When Oil Gushed at El Dorado, Ark.

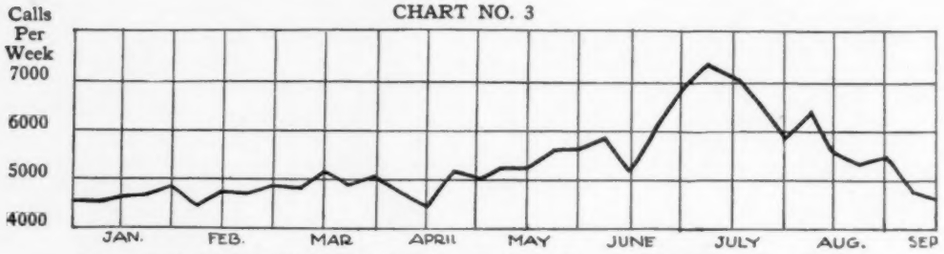
Trade's Handwriting on the Wall

CHART NO. 2



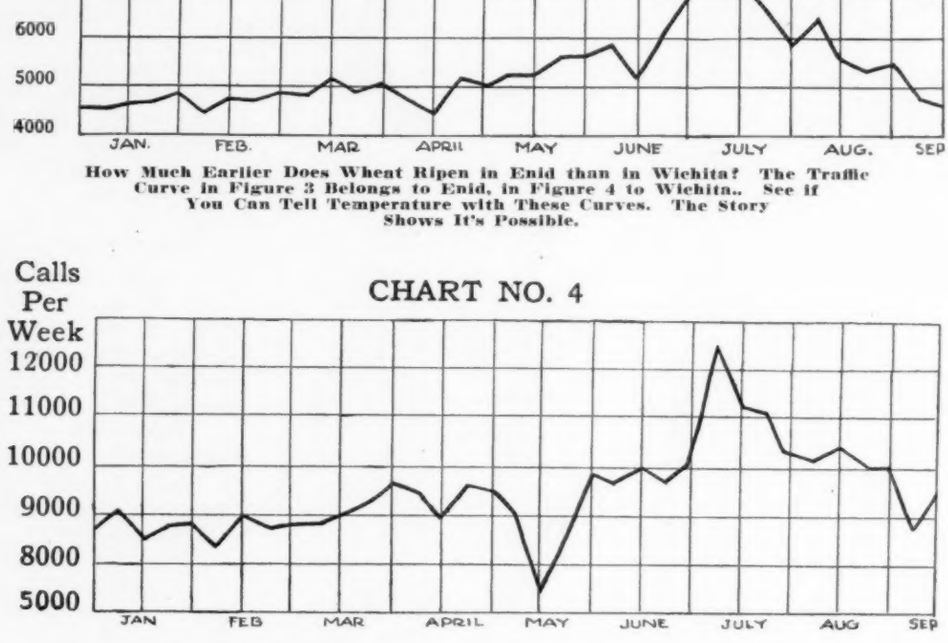
Everything was Running Smoothly in Dallas until Cotton Price Jumped in August. Toll Traffic Curve Jumped Along Too!

CHART NO. 3



How Much Earlier Does Wheat Ripen in Enid than in Wichita? The Traffic Curve in Figure 3 Belongs to Enid, in Figure 4 to Wichita.. See if You Can Tell Temperature with These Curves. The Story Shows It's Possible.

CHART NO. 4



is sold in or through Dallas. Long distance handles much of this business. Do you recall the slight demand for cotton last year, and how that slight demand sent the price downward? With no market the growers could do nothing except store their produce, and await a favorable price. Suddenly, the first week in August, the demand for cotton increased and the price jumped $8 a bale.

That $8 jump put every Dallas broker and grower on the jump. They hopped to long distance wildly calling points where they thought they might unload at the increased price. That's why the curve jumped. It was just one "little movement"—an $8 increase in cotton, but it sent outgoing toll calls in Dallas up 2750 calls a week! What effect do you think that had on traffic force? Let's ask the toll operator to tell us.

These two illustrations in the upper movement of the traffic curve are from unexpected causes. Traffic people might refer to them as "expected unexpected" causes, because they are likely to happen any time, but you never know just when to expect them. Now, let us consider another side of the traffic curve—the expected peak. In certain localities toll traffic and local, too, for that matter, mount a stated periods of the years. This is due to some peculiarity of the individual locality. For instance, take the wheat country. Enid, and Wichita are two of the great wheat centers in the Southwestern's territory, and wheat growers and brokers in Oklahoma and Kansas, like the cotton dealers in Texas, do most of their selling by long distance. Every year wheat ripens about the same time in each locality, so a "wheat peak" can be expected.

Chart No. 3 shows the outgoing toll traffic curve for Enid for 1921. Isn't it easy to see by it, that Oklahoma farmers began to sell their wheat early in June? In fact, it took the "little movement" just about three weeks to reach its peak, after which it slowly declined to normal. Now, look at Chart No. 4, which covers the outgoing toll traffic in Wichita for the same period. Wichita is north of Enid, and wheat ripens in Enid earlier than it does to the north. But how much earlier? Look at the chart, and you have the story. The "every little movement" is shown as plain as day. The curve says two weeks later, and that is correct.

Doing Your Publicity Bit?

Martin J. Insull Tells Utility Men to Give Public Inside of Company's Problems Every Chance Afforded by Meeting of Citizens

Martin J. Insull gave public utility men a good suggestion for the promotion of cordial public relations when he said recently to southwestern public utility men: "I was very much amused some years ago when we heard the manager of a Telephone and Telegraph Company tell in a speech of an incident that happened in his own business. He went to see the manager of one of the American Telephone and Telegraph sub-companies somewhere in the country, and that particular morning the manager was in a very bad humor—he got out of bed on the wrong side, as we would say—Mr. Hall asked him about the trouble and the whole complaint was the size of his electric light bill. Mr. Hall remarked to him "this is a fine thing for one utility man to be complaining of the size of the bill of some other utility. You have undoubtedly had the service, and you ought to pay the bill and do it without comment."

"Now, that just illustrates to you what the point of view of the ordinary public must be when they get a light bill or a gas bil, or a bill for water or a bill for heat or a telephone service, they have nothing to show what that bill was for. We are not selling them a commodity you see; they haven't anything tangible to put their hands on, and when they have to pay the bill they feel as though they were paying for a dead horse. Now, what is it that you have sold them, and for which they are to pay? It is not a commodity, it is a great service. It is impossible for them to see the millions and millions, aye billions of dollars, that their thrifty fellow citizens have gathered together and invested in these great utility properties. They never think of that. I will ask you: "Have you ever told them of it?" Have you, in your communities, ever gone to your commercial club and explained to them that when they push the button and get the light what is back of that button? Have you ever told them that in the electric light and power business in this United States there is four and one-half billions of dollars invested? Have you ever told them when they push that button that they have the use of the investment of several millions of dollars that is subject to their call; that it is operating twenty-four hours a day for their convenience? If you haven't told them, how do you expect them to find it out? Who is to blame if they don't know it? You utility operators. The way for you to tell them is to go out in your communities, to your Rotary Clubs and Commercial Clubs and tell it. That will make one good story and there are many more that you could well tell them.

Now consider this business as compared with a commodity business. Take it all over the country, the utility business as a whole for every dollar of income received has invested in it somewhere in the neighborhood of five dollars. With increased rates it may be a little less, but it is somewhere between four and five dollars. So we are in a business that turns its capital only once every four or five years; but we are expecting from a public that is used to being in a business that turns its capital two, three, four, five or six times a year, the same kind of reaction toward our business as we have without them knowing the real conditions. Their business is absolutely different; a man goes into a business that turns its capital four times a year and he puts ten thousand dollars in it; he has a "turnover" of forty thousand dollars. If he is a good merchant he expects to make ten per cent; then on a business of forty thousand dollars he has made four thousand dollars and paid all expenses. Now, allowing him a reasonable rate of return on his ten thousand dollars, I will say ten per cent, he would receive interest of a thousand dollars and three thousand dollars profit. That is his business, now what is yours? You are allowed to charge such reasonable rates as will provide operating expenses, depreciation and a reasonable return on the money invested in the property used for the public interest. There is no such thing as that three thousand dollars profit in your business; all you get is a reasonable rate of return on the money invested in your business. Have you ever gone out and told the public that? If you haven't, just to oblige me, when you go home tell it to them. Tell them this utility business has got down to the point where there is no profit in it; all there is is a reasonable return on the money invested.

"Now in a business of that kind how can you build up out of earnings an amount which will provide for the necessary future extensions of the business? My merchant had something to do that with, but where have you got anything with which to do it? Nowhere. The Commission may allow you some reserve accounts to take care of contingencies, which you are entitled to, but you have no profits to put aside month by month, year by year, to provide new capital for extensions. You haven't told the public that! It means no more profit to us, it probably means trouble to make the extensions to provide the service they demand, because all we can earn on the increased investments is "a reasonable return." Now, why don't you tell that to the public? Why do you let the politician go about and say you are "bleeding the public," and stand idly by and not say: "Come down to the office and I will show you our books. I will show you what we are doing. I'll show you what this politician says is not true." We started years ago at the wrong end; we started at the political end and we should have started at the public end. Let's get reversed and reversed as quickly as we know how, because if you can satisfy the public and secure their favorable opinion you need not worry about the political end, that will take care of itself!

"We all have a lot at stake, and it is our duty to protect it, and the way to do that is to make the public our friends, and the way to make them our friends is to tell them the truth and let them know what our business really is.

"I am not going into the question

of regulation, but I am going to gather together the things I have been trying to tell you, and tell you why I think the utility business is the public's business. Largely it doesn't matter whether it is by state regulation or municipal regulation or by general feeling, you can only charge the rates that the public will allow you to charge. Now, just face it, that is about the situation. If it is under regulation, state or municipal, it is the representatives of the public that say what the rates shall be. If it is where there is no regulation it may be largely a kind of horse trade, but you are not in a position to charge any rate you desire. In the end the rates you charge are only the rates the public will allow. For the same reason the class of service is largely the class of service that the public demands. So, the success or failure of our business is largely in the hands of the public. They are really more interested in the success of our business than we are ourselves. We can only get a reasonable return on the money that we continue to invest; their whole future business and social life depends on the proper development of these utilities in the United States. So, isn't this utility business far more the business of the public than it is of the operators?

"Now, gentlemen, I want you to go home and go into your own communities and tell this same story. You are in a better position than I am to tell it. I came many miles to tell it to you. I go any time I am asked to tell it to Commercial Clubs and other organizations in any of the states in which I am interested or in which we operate, and we operate in some fifteen of them. Now if I can do that, you gentlemen have as much time as I have. Go home and start in by educating your own people, or rather start in by educating yourselves. Give some thought to this matter; think about it along the lines of the inter-relation beween the utility investors and the public; then educate your own employees, because they are the people that have close contact with the public.

"Try to arrange to speak before your commercial bodies, your Rotary Club, your Kiwanis Club. Tell your story there, tell it wherever you have an opportunity. If all the operators in this country would do that we would soon change public opinion from an unfavorable position to a fair-minded and more favorable position. If you don't do it nobody else will or can."

MASTERS AT WORK.

Two Sterling Examples of What Can Be Done With Phone Advertising.

Chicago, Ill.—From two widely separated points come telephone company advertisements that will give ideas to the manager or other person responsible for advertising of a telephone company.

In one of the advertisments the New York Telephone company advertises the Golden Rule to party line subscribers. The New York advertisement says:

On a Certain Party Line.

"So the story comes to us—when one of the subscribers made his third attempt to telephone, and found himself intruding on an extended argument about how long to roast a turkey, he was considerably annoyed. However, he had a brilliant inspiration and he shouted into the telephone, "Madam, I smell your beans burning." Whereupon both parties engaged in conversation rushed from their teelphones, and the man had no difficulty in making his call.

"The story may be old, but seriously speaking; every subscriber on a party line shares with the others the responsibility for making their service most valuable for all. It is a co-operative proposition.

"And the service is most satisfactory when every subscriber keeps the Golden Rule in mind when telephoning."

The other worth while example of profitable telephone company advertising comes from Abilene, Kansas, where there is a company that gets good value for every nickel it spends in advertising—and it's no piker in spending.

An eye-catching headline, "PARTNER WANTED for going concern," heads an advertisement of the United Telephone company which reads:

"If You Want Your Town to Stand Still, Don't Read This!

"You'd wonder what the above announcement was all about if you read it in the paper. Yet it sums up an actual condition that concerns you and the development of your town.

"The Telephone Companies want the public as partners. Their problems are your problems, their losses are your losses, their success your success and they want you to recognize that fact.

"They've appealed to you as citizens, but you were too busy. You turned the whole question of regulation over to commissions and thought your responsibility ended there.

"They've talked to you as investors, but many of you haven't given a thought to the safety and libertal return of a Public Utility security.

"If your town is to grow, if your community, whether it be rural or urban, is to prosper, you cannot afford to let your Telephone Company shift for itself—you must make its business your business.

"As a partner a little effort will help a lot. Just lend your good will if you can't lend your money. Back them up in their efforts to improve your service and extend it to others who want it. Do this and you will have nothing to regret."

Wheelbarrow Wireless Outfits Talk of China.

Shanghai, China.—Marvels of the wireless telephone have taken the Orient by storm, says Professor C. H. Robertson, an American lecturer, who has been demonstrating the latest developments of electricity throughout China and Japan during the past six months. On the first day he puzzled the Celestials of Shanghai by carrying on an intelligible conversation with some mysterious individual in empty space, it was estimated that more than 14,700 natives came to witness the performance. Before he had left the city his lectures on the wireless phone had been attended by an aggregate of at least 300,000 people. Professor Robertson, who is being aided in his work by the China Electric company, a Western Electric interest, found the easiest way of interesting the Asiatics was to take his wireless telephone station through the streets of the crowded cities on a big Chinnese wheelbarrow. Every now and then he halted and carried on a wireless talk with his associates who had set up another station in their quarters. The stations were up to date models and were the identical ones that were used in the great Victory Way celebration in New York City after the Armistice. The wireless demonstrations attracted widespread attention with the result that the professor was swamped wiih requests for his attendance before colleges, government officials and foreign associations. Officers of the Chinese Army were particularly interested. They staged several lectures under Professor Robertson's direction.

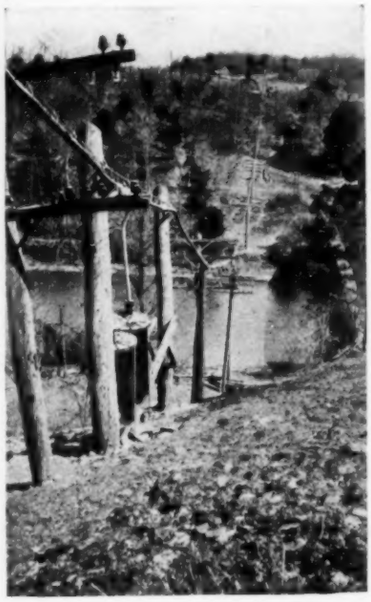
Cable Wizards in Big Feat

Harrisburg-Pittsburgh 192 Mile Cable a Triumph of Men and Methods—Longest Line Had Many Defiant Problems for the All-Star Crew to Solve

By F. E. Galbraith

American T. & T. Company Division Superintendent of Cable Construction, New York

Have you ever travelled from Harrisburg to Pittsburgh on the Pennsylvania Railroad—that wonderful ride over the mountains and around the Horseshoe Curve? Have you ever driven west to Pittsburgh over the Lincoln Highway, crossing that impressive range of mountains, including the Tuscarora, the Blue, the Seidling Hill and the Alleghanies? Probably nowhere in America are there scenic beauties to surpass those to be encountered on either of these trips. But—



River Crossing and Loading Point Near Everett, Pa.

How would you like to be called upon to construct a pole line and a cable across these mountains and do it within a specified time and for a specified sum? That is just what Division One Plant has done, and not made much fuss about it, either.

Here is what the job involves: The distance, by the route selected, is 192 miles. The cable is aerial, except where it passes through towns, so that it was necessary to erect over 170 miles of new pole line and buy or build twenty miles of underground conduit. In addition, 152 aerial loading fixtures had to be provided, at each of which two loading pots will be placed initially, with an ultimate of five or six.

In addition to the pole line and cable, space was required at each of three approximately equi-distant points for the repeaters and the associated apparatus, without which many modern telephone and telegraph achievements would be impossible. At Shippensburg, Bedford and Ligonier, repeater stations have been erected. These are handsome and substantial brick buildings. They are designed to house the equipment, apparatus, power plant, testboards, etc., that go to make up a modern repeater station and may be readily enlarged at some future date when the growth of the service requires.

Below—Setting a Pole Half-way up a Steep Hillside.

The cable is "full sized," that is, the outside diameter is 2⅝ inches, which is as large as telephone cables are made. The make-up is as follows:

Harrisburg to Ligonier

16 quads No. 16 A. W. gauge conductors

125 quads No. 19 A. W. gauge conductors

Making One of the Many Test Splices Along the Line.

Ligonier to Pittsburgh

19 quads No. 16 A. W. gauge conductors

120 quads No. 19 A. W. gauge conductors

Contrast that with the original duplex cables, installed about ten years ago, which were also full sized, but which contained in one instance only twenty-five quads of ten and thirteen gauge conductors and twenty-four nonquadded thirteen and sixteen pairs.

The work of splicing this cable is greatly complicated by the presence of certain groups of conductors which are arranged for "four-wire" operation, neessitating the most careful work on

the part of the splicers. There are five separate groups of wires which must be kept separate at every splice. Each group is identified by having each quad therein wrapped with strings of different colors, such as red, red-orange, green-orange.

This is but one of the many refinements embodied in the cable, the failure to observe any of which would lessen the effectiveness of this important and expensive piece of plant. It must be borne in mind that any defects in a cable of this type are much more serious than would be the case in a shorter cable. For instance, a small amount of cross talk in this cable would be so magnified by the repeaters that the circuit would be unfit for commercial operation. But, on the other hand, when properly installed, as the Division One people modestly admit this one will be, a cable of this order can transmit simultaneously at least 500 messages, including both telephone and telegraph, with perfect privacy assured to each patron.

The loading pots now being installed will load a total of sixty quads of conductors, twenty-four in one pot and thirty-six in the other. The phantom circuit associated with each quad is loaded as well as the two physical circuits. The loading is on a "heavy" basis, the loading points being 6,000 feet apart. Open wire loading points are spaced every eight miles.

This is the longest cable installation ever undertaken in this country, and it is the most difficult. The selection of the route was in itself a tremendous undertaking on account of the large number of factors which had to be taken into consideration. All possible routes were carefully surveyed and their respective advantages and disadvantages weighed. One route followed main highways, but was too long; another was shorter, but involved a lot of hazards, electrical and otherwise; a third was desirable except that railroad facilities were so meagre and the topography so unfavorable, and it was felt that to follow this route would result in uneconomical construction. The final selection runs somewhat to the south of a straight line connecting the two terminals, and experience has shown the wisdom of this choice.

Desirable as it may be, by comparison with the others, it had many features to cause a lot of wiseacres to shake their heads and say: "It can't be done!"

But it can be done—it has been done.

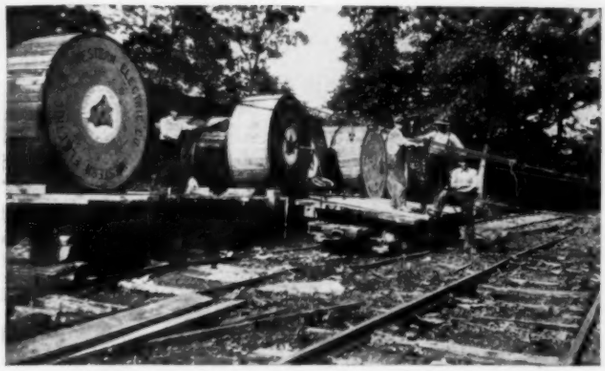
Incidentally, this cable follows closely the route of the old Philadelphia-Chicago Line, an open wire line built some twenty years ago, thus justifying the judgment of those who selected that original route.

Tank Type Tractors with Trailers and Reels of Cable Breaking a Path up Wills Mountain.

Preparing a "Balloon" Splice to be Set in at a Loading Point.

Hauling Poles with Truck and Trailer.

Undoubtedly, the biggest problem was that of transportation, particularly of the heavy materials, such as poles, reels of cable and loading coil cases. There was also the question of getting this material on the ground with a minimum of hauling, which involved a careful study of the entire job, with especial regard to the location of railroad stations or sidings and the condition of the various roads from these points to the line. As a result it was possible to order material in such a manner that the shipment to each point could be most efficiently hauled from there to the section where it was to be used. Consideration was



Unlonding Reels from Narrow Gauge Cars.

Pulling in on Market Street Bridge, Harrisburg.

Pulling Cable into Rings in a Mountainous Section.

of course given to the matter of reducing as far as possible up-hill hauls with loaded trucks.

The route of the cable is through Fulton County, which has the doubtful honor of being the only Pennsylvania county in which there is no railroad. There is however a narrow gauge log road, which was utilized to good advantage. This lack of shipping facilities made necessary some long hauls —in one case the distance from the railroad to the line and along the line to the limit of that particular shipment was nineteen miles.

Distribution of material was made, as far as possible, with motor trucks, a huge fleet being available for this purpose. Wherever possible, the trucks delivered the material direct to the spot where it was to be used. Where conditions made this impossible, "parks" were established and a quantity of material deposited there, to be further distributed by other means. Poles were distributed at the stakes by means of teams, by means of block and tackle attached to trees and by means of the winch rope on the motor trucks.

Reels of cable presented a serious problem. They weigh about 4,900 pounds each and are extremely difficult to handle. The same is true of the loading pots, which weigh 2,200 pounds or more. Both cable and pots are readily damaged and require extremely careful handling. Two five-ton tank type tractors were provided for the distribution of this class of material and proved indispensable for that purpose, as well as for assisting trucks.

By means of trailers or stone boats, the material was hauled by the tractors from the storage points to its location in the line, often with a great deal of difficulty.

There are sections of the cable where for over a mile it was not possible to make stake deliveries of the cable. As each reel contains 500 feet of cable, this meant that perhaps twelve reels had to be taken care of in some other manner. The pulling in trucks were each equipped with 6,000 feet of pulling in rope, steel, of great strength and flexibility.

By this means, under certain conditions, 6,000 feet of cable could be pulled in from one point. With the truck located at one point and the reels of cable at the distant point, the winch rope would be pulled through the rings and attached to the end of a reel-length of cable. This length would then be pulled into the rings, and the "nose' pulled up to the point where the truck was stationed. The rope would then be disconnected, carried back to the other end of the first reel, *outside* of the rings, then *through* the rings to the point where the reels were located, and a second reel attached and pulled up so that it just overlapped the first one a sufficient amount to allow for splicing. This would then be repeated until all of the reels had been pulled into place.

It was often necessary to carry tools, ladders, platforms, tents and testing apparatus a mile or more from the nearest point which could be reached by a truck, to the points where the work was to be done. Sometimes the splice would be over a ravine, at other times over a river, calling for great ingenuity and care to enable the work to be accomplished without subjecting the men to danger.

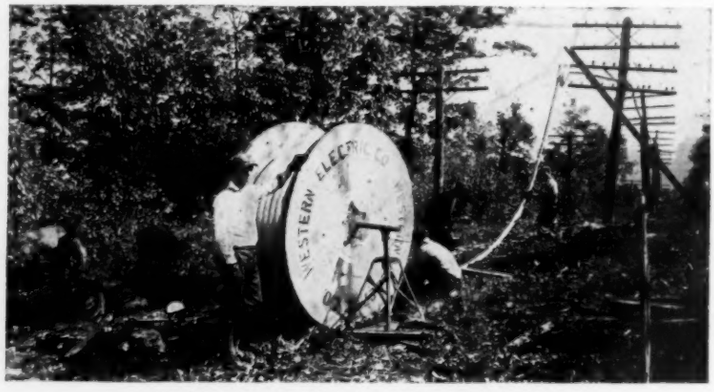
This job as a whole is the largest single construction job ever undertaken by the Long Lines department and the cable and associated equipment represent the most modern practices. This article covers principally the outside construction features.

C. E. Baldwin and Fred Roller were charged respectively with the field engineering of the route and pole line structure and the supervision of the erection of the repeater stations. Mr. Baldwin was assisted by E. W. Welch, D. W. Sager, R. J. Hughes and C. A. Marsh, who made up the personnel of the temporary "field office" set up in Harrisurg for this job, while Mr. Roller had as his first lieutenant, E. W. Neimeyer.

The erection of the pole line and messenger was handled by the forces under W. F. Norris, Division Superintendent of Line Construction, who was represented in the field by W. E. Ainsworth, Division Supervisor of Lines, and General Line Foreman Elmer "Cub" Miller. Gangs under Foreman Hoover Gleim, "Bill" Middleton, George Hotchkiss and "Ed" Nace lived with this part of the job from start to finish, while gangs under Foreman Jones, Donnelly, Feasey and Myers were engaged on it for shorter periods.

The actual location and staking out of the line was done by gangs under N. T. Wood, R. B. Whittaker and "Mike" Grady. The unloading, hauling, distributing and placing of loading coil and cable was handled by gangs under Foreman John McDonald, W. S. Symons, Joe Dalton and W. P. French.

General Cable Foreman W. J. Foster was in charge of all cable work up to the time of his death, when he was succeeded by Oliver J. McComsey. The splicing and loading work has been handled by crews headed by Splicer Foreman Earl Riley, E. F. Yost and L. A. McComsey, and the cable testing by testers under R. M. Oram. John D. James handled the thousand and one technical details which came up in connection with the actual cable construction.—*Long Lines.*



Paying Off Cable from Reel Near Bedford.

Judge Berry, Illinois Magnate, Dies Suddenly.

Jacksonville, Ill.—Orville F. Berry, of Carthage, Ill., president and general manager of the Mississippi Valley Telephone company and prominent in the political and legal circles of Illinois died suddenly at a hospital here, on December 19th. The judge had served on Illinois commissions with distinction, and at the time of his death was general counsel for the Illinois Telephone association. He was an exceptionally talented, successful and popular man, and his passing is mourned deeply by the Illinois telephone fraternity.

Fort Wayne Papers Allow Bohn Big Space for His Story.

Fort Wayne, Ind.—Frank E. Bohn, secretary and general manager of the Home Telephone company has shown the telephone industry how to handle the utility's side of a rate increase case so it is real news and gets plenty of newspaper space. A recent issue of the leading Fort Wayne paper carried two columns of Bohn's human interest statement on the necessity for a rate raise.

STILL ASKING FOR BACK ISSUES.

TELEPHONE ENGINEER has urgent requests for some copies that are out of print. Any subscribers who can send us copies of the following issues will have ther subscriptions extended two months foi each copy sent.

The issues wanted are

1—February, 1921.
11—March 1921.

TELEPHONE ENGINEER
Editorial Offices
STEGER BUILDING
CHICAGO, ILL.

Chas. Soby, Gray Pay Station Official Dies at Hartford.

Hartford, Conn.—Chas. Soby, one of the founders of the Gray Telephone Pay Station company, and for thirty years in its service as director, secretary, and treasurer, died here in December, at the age of 67.

TO SPLIT MICHIGAN.

Utility Commission Plans to Divide Territory or Force Universal Connection.

Lansing, Mich.—Duplication of telephone companies in Michigan cities must be done away with, is the opinion of the Michigan Public Utilities commission

If the contemplated division of properties between the citizens of Grand Rapids and the Michigan State does not bring results, the commissioners threaten to force physical connection between the competing systems. Prospects rather promise a legal battle before the issue is decided.

According to Michigan reports throughout the past summer it was understood that the property transfers would be made in September. The Michigan State was to obtain the Citizens exchanges in Jackson, Kalamazoo, Lansing, Battle Creek and all of the towns and cities except those near Grand Rapids. The Citizens was to have the Bell exchanges in Grand Rapids and the surrounding towns. Since the Citizens was to surrender the greater amount of property, it was to receive about $600,000 in cash.

During the summer, however, congress passed the bill amending the interstate commerce act in such a way that the American Telephone and Telegraph company, which controls the Michigan State company, cannot be prosecuted under the Sherman antitrust law.

The A. T. & T. might have been prosecuted under the old law if it had sought to swallow the Citizens company whole.

When this new law became effective the Michigan State lost interest in the three-year-old plan for division of territory with the Citizens company. It is understood to have announced that it could consider no proposal except one under which it would take over the Grand Rapids exchange and everything else belonging to the Citizens company.

Prospects were that there would be a telephone war in Michigan similar to that of a few years ago. This is believed to have been averted by the action of the commission in making it plain that failure to reach an agreement would mean physical connections in all competing exchanges.

There could be no telephone war where a physical connection exists. At least, such a war would be disastrous to the winner of it, experts say.

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HE USES THEM

And has found his dry battery cost problem solved. Everywhere records of service made by French Telephone Dry Batteries have been the sensation of telephone circles.

Order a barrel now for trial. You will then understand why their marked qualities of superiority usually lead to their general adoption.

Better service is built into them. High capacity combined with "Protective Coating" that reduces internal action while the battery is not in use, is a combination specially suited to telephone needs.

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Beating Attack of Pole Rot

How Rot Feeds and Thrives — Effective Methods of Applying Pole Preservative Treatments—University Expert Gives Illinois Association Survey of Subjects

By E. E. King

Professor of Railway Civil Engineering University of Illinois.

The length of life of a telephone pole varies with the kinds of wood, the sizes of poles and the conditions under which they are used. The poles most commonly found in service in this section of the country are Northern White Cedar and Western Red Cedar. Many chestnut poles are also found, but as they are not so durable as the others they are less frequently used. The servicable life of an untreated cedar pole is variously estimated to be from eight to fifteen years. The primary object in treating poles is to prolong their physical life by protecting them against the agencies of decay.

Decay of wood is the result of the action of certain forms of low plant life called fungi. The fungi grow in thread-like forms that penetrate the cells of the wood. They are able to secrete a ferment that acts on the organic matter in the walls of the cells dissolving it and using it for food. These little plants use this food as larger plants use the food from the soil. These threads, called mycelia, gradually extend their numbers through the cells eating their way through the walls from cell to cell. After they have absorbed a large portion of the organic matter the remainder crumbles, turns brown, and assumes the form we ordinarily term decay.

Decay Indicators.

These mycelia finally grow until they form on the outside of the wood a hard crusty structure called a bracket or toadstool. The presence of these formations is a certain sign that the interior of the wood is decayed even though the surface may appear sound. The top of the bracket is comparatively smooth, but the under side is full of holes or pores in which grow millions of spores attached to the ends of these mycelia. When the spores ripen they fall from the cell in the form of dust. These correspond to seed in an ordinary plant. Later these spores are carried away by the wind. Most of them fall where they can do no harm, but a few fall in the cracks of wood or in some place where they can begin to grow and thus repeat the cycle.

Besides food, other requirements for fungus growth are moisture and air. In the case of the telephone pole is found a splendid example of moisture and air as factors in the decay of wood. For two feet below the ground line in ordinary soil there is plenty of moisture and air for fungus growth; but below this, while there is plenty of moisture, there is usually a very limited amount of air. Above the ground line there is plenty of air, but the moisture sufficient for decay is found only about six inches above the ground. The remainder of the pole becomes air seasoned; and decay, if it comes at all, comes very slowly. Poles set in gravel or broken stone are less likely to decay than those set in loam because they are likely to have a lower moisture content. The temperature is also an important item to consider in the question of fungus growth. The most favorable temperature varies from 60° to 90° F. Either above or below this range the rate of propagation is limited.

Poisoning Decay.

As it is not feasible to control the air supply nor the temperature and moisture content, the only safe and certain thing to do is to control the food supply. The most practical way of handling that so far has been to poison it with an antiseptic agency. It is necessary to choose some pretimber without being detrimental to servative that can be injected into the the structure of the wood and without being poisonous to man and animals. It should be easily handled, should be as nearly inflammable as possible, and should be cheap enough to find a ready market. Furthermore, it is advisable to choose something that is not soluble in water. Many of the salts that are toxic are readily soluble in water. Consequently they would soon be washed out by the rains if they should be used, thus leaving the timber without protection. Many solutions that are toxic to fungi evaporate at such a low temperature that they become ineffective in a comparatively short period of time. The length of time the preservative remains in the wood is one measure of its economic value as a preservative.

The preservatives now found in commercial practice that meet these requirements best for treating poles are coal-tar products obtained during the distillation of coal-tar in the production of pitch and dye-stuffs. Coal-tar, itself, is a by-product resulting from the destructive distillation of bituminous coal in the manufacture of coal-gas and coke. The oils used are those that distil between the temperatures of 210° C. and 355° C. Those having their greatest percentages distilling between 230° C. and 270° C. constitute the creosote oils, while those having their greatest percentages passing over at higher temperatures constitute the anthracene oils or carbolineums. Coal-tar, itself, possesses very little value as a preservative since it is so heavy that it cannot penetrate the fibers of the wood. For the same reason it should not be mixed with any of the creosotes or other oils for use in the ordinary processes of treating poles.

Assuring Absorption.

Before the preservative is applied to the timber some method must be adopted for removing the surplus moisture from the cells and cell walls of the wood, for it is a well-known fact that the drier the wood the more preservative it will absorb. The usual method is to pile the timbers in the

open air in such form as air can circulate through them freely and in such places as they will be free from moisture, grass, weeds, rubbish and even shade. The piles of poles should be supported upon skids in such a way that the lowest pole will be, at least, one foot above the ground. These skids, themselves, should be treated or should be entirely free from decay.

The simplest method of wood preservation is the brush treatment, which is a painting or a mopping of the surface with liberal quantities of hot preservative oil. In addition, a special effort is made to flood all cracks, checks and knots. Two or more applications should be given for best results, in each case allowing the one coat to dry a day before another is applied. The oil should be heated to a temperature of from 150° F. to 200° F. This has the effect of giving a deeper penetration. It has been the experience of engineers connected with the American Telephone and Telegraph company that two coats of preservative applied by the brush method will resist decay better than one, while a third coat will add very little to the life of the pole.

Sometimes instead of giving the entire butt two full coats, only that portion between eighteen inches above the ground line and two feet below receives the second coat. The top of the pole and gains where the ends of the fibers are exposed should receive a two-coat brush treatment the same as at the ground line. All brush treatments should be done preferably in dry warm weather in order to get a good penetration. Applied on a cold day, the oil tends to harden immediately after striking the surface of the wood. In case a number of poles are to be brush-treated in the same yard at one time, it is advisable to brush or mop the top half of a number before turning any of them over to finish the other half. This allows more time for the preservative to soak into the cracks and checks.

Many companies are using the higher-boiling anthracene oils for the brush treatment with the idea that since they are less volatile they will remain on the surface of the pole for a longer period and afford a longer protection. If the untreated poles should last 12 years without treatment the brush treatment should prolong its life from three to five years. The expense of treating poles by the brush process depends upon the size and number of poles, the cost and the amount of preservative used, and the cost of labor necessary to prepare the poles and apply the preservative. The largest item of expense in this method of treatment is the cost of labor. The expense for treating by this process may run as low as thirty cents for a small cedar pole, while it may run as high as a dollar for a larger one.

Sometimes instead of applying the oil with a brush it is poured on hot in order to get a better penetration into the cracks and checks, as it is false economy to apply a treatment to the outside of the pole and not allow the preservative to fill the cracks and checks. This also is an inexpensive process and does not require any equipment except a container for holding and heating the oil and one to catch that which runs away. The advantage of all these superficial processes is that they can be used in treating poles in small or large lots at any point without employing expensive equipment for handling.

Clean Surface Essential.

In applying any of the processes it is very necessary for good penetration that the surface of the pole be cleaned to remove all dirt and both the inner and outer bark at the point of treatment. Neglect of this is the cause of uneven and inferior penetration. The deeper the penetration, of course, the more durable against decay. There seems to be some difference of opinion, however, among treating engineers as to whether or not the poles should be shaved. Poles wet by rain or snow should be allowed to dry before applying the preservative treatment.

In order to insure a better penetration of the wood and of the cracks and checks, the poles are sometimes given a dipping treatment by standing them on end in the hot oil in an open-tank for fifteen minutes or more when required. They are then removed and laid aside to dry. The oil must be heated in order to get a good penetration. This requires a steam pipe immersed in the liquid or an arrangement for building a fire beneath. It also requires a derrick or other appliance for handling the poles efficiently; and as the process involves a considerable outlay for equipment, it can be used economically only where a comparatively large number of poles are to be treated.

A means frequently used to get a still deeper penetration is the open-tank impregnation hot and cold oil process whereby the poles to be treated are placed upright with the ends submerged in the heated oil and kept there from two to six hours as desired. After that they are plunged into a tank of cold oil where they remain until they are cooled. The size and shape of the tank will be decided by the size of the poles, the amount of the surface to be covered, and the number to be handled at a single time. This method gives a deeper penetration than the dipping process, but it requires more oil, the additional tank, and a longer time for the operation.

Treating Specifications.

In order to establish a uniform practice for open-tank treatments, the Western Red Cedar and other associations have adopted specifications known as treatments "AA," "A" and "B." Among other things, treatment "A" specifies that "the poles shall be placed in an upright tank with the butts fully and continuously submerged in the preservative for not less than fifteen minutes when the atmospheric temperature is 70° F. or higher, and a proportionately longer time when the temperature is below that point; that is, during the colder weather and the time of immersion must be sufficiently longer to result in the wood's becoming as thoroughly heated as it would be under a fifteen minute treatment when the atmospheric temperature is 70° F. or higher."

"The preservative shall be heated to a temperature of 215° F. at least once every four hours of treatment, and shall not be allowed to fall below 180° F. or reach about 230° F."

"The creosote shall be a coal-tar distillate obtained entirely from coal-gas or coke-oven tar and must not contain any admixture of any other tar, oil, or residue obtained from petroleum or any other source, including coal-gas tar or coke-oven tar. The oil must be completely liquid at 100° F. and be free from suspended matter."

The specifications for treatment "A" are the same as for treatment "AA" except instead of creosote the preservative shall be carbolineum.

Treatment "B" provides for a continuous submersion in alternately hot and cold creosote for a minimum duration of six hours. The duration of the treatment shall be divided between a hot and cold bath. The poles shall remain in the hot bath for four continuous hours, after which they shall be transferred to the cold bath in which they shall remain for two hours.

"The preservative constituting the hot bath shall be heated to a temperature of 212° F. at least once every

four hours and shall not be allowed to fall below 180° F. or reach above 230° F. The temperature of the preservative constituting the cold bath shall not exceed 112° F. at the conclusion of the treatment."

Effect of Treatment.

The effect of the hot oil is to heat the wood immersed in it and thereby expand the air and moisture that its cells contain. When the hot wood is suddenly cooled by plunging it from the hot to the cold oil, the air and moisture in its cells contract and form a partial vacuum. The atmospheric pressure from the outside then drives the preservative which has already penetrated the surface still further into the wood. The best effect is secured when the preservative penetrates entirely through the sapwood and enters to some extent, at least, into the heartwood. The specifications of the American Telephone and Telegraph company prescribe that for the "B" treatment the depth of penetration shall not be less than one-fourth inch when the sapwood is one-half inch or more in thickness. In case the sapwood is less than one-half inch, the depth of penetration shall be not less than one-half the thickness of the sap-wood.

If the original untreated pole should have a natural life of twelve years, the "AA" dipping treatment should prolong its period of usefulness from four to six years, the "A" dipping treatment from six to eight years, and the "B" hot and cold bath open-tank treatment from ten to fifteen years.

The additional amount of time, labor, equipment and preservative required for the "B" grade of treatment makes a more expensive product than the other processes. In many instances this may tend to limit the application of this type of treatment to cases where there are a great many poles used in a yard, to such poles as are used in the most substantial types of construction, and to cases where the changing out of the poles involves a great deal of expense in labor and material items and inconvenience in discontinued service. Where the pole-handling companies and utility companies have open tank treating plants in their own yards, they handle such large quantities of poles in a year that the cost of treatment for a single unit is materially reduced. While this form of treatment is more expensive than the more superficial processes, yet since the penetration is deeper, it results in a longer life and consequently a longer continuous service. The factors of heavy labor expense and interrupted service during renewal may enter and may be even a greater consideration than the first cost of treating and erecting ordinary poles.

Seasoning is Vital.

The necessity of seasoning the poles before treatments are given by any of the foregoing methods must be recognized. Poles that are only partially seasoned before treatment are very likely to check shortly afterwards; and if the check forms in the treated surface and opens deeper than the preservative enters, thereby exposing the unprotected wood to the destroying fungi, the effect of the treatment is largely lost. This feature is especially important in the brush treatment, and is the general cause for eventual failures in any superficial treatment.

After the poles are treated linemen should guard against using hooks, tongs or spurs on the treated portion. The surface should not be damaged in any way by breaking or cutting the protecting cover. Neither should the treated pole be dragged along on the ground. Any places on the treated surface that may become damaged should be protected by brush applications.

Uniformity Necessary.

One very important phase of a study of this type of treatment is to get a uniform penetration of the preservative over the entire surface treated. In practice, it is frequently found that one side of a pole resists the treatment while another portion readily absorbs it. It is found, also, that some poles absorb the liquid much more readily than others. In order to get something like uniform results throughout the entire lot of poles treated, a process of perforating or puncturing the poles has been commercialized that is giving reasonably satisfactory results. The knives of the perforating machine cut longitudinally and separate the fibers along the grain of the wood. The perforations are deep enough to guarantee either a three-eighths inch or a one-half inch penetration of the preservative as desired in case the sapwood is this thick or thicker. If the thickness is less than three-eighths inch the preservative will penetrate entirely through the sapwood. Cutting lengthwise of the pole or parallel to the fibers of the wood does not materially weaken the strength of the pole. The cutting is done from a point eighteen inches above the ground line to two feet below the ground line in some cases and to the base of the pole in other cases.

As the physical life of the poles is prolonged by one or the other of these processes, economy warrants an equal life from the various pole fittings. For fir cross arms, an equal life may be obtained by open-tank inpregnation similar to that used for the pole-butts. When wood like southern yellow pine is used that naturally has a shorter life than the cedar pole, it is generally profitable in such cases to use either the hot and cold bath "B" treatment in which the entire cross-arm is submerged at one time, or the pressure process. When the pressure process is applied to cross-arms, an empty-cell treatment should be given; and especially in cases where the dipping of the preservative may cause serious damage, the impregnation should be light.

The pressure process of treatment of cross-arms should provide that the arms should be sorted into two or three groups according to the amount of sapwood they contain. Each group should be treated in the cylinder separately, and arms of only one size should be treated at one time. All cutting and boring should be done before treatment.

In case the timber should not be seasoned, steam under a pressure of from ten to twenty pounds should be turned into the cylinder and this pressure be maintained from one to five hours depending upon the moisture content of the wood. After the steaming is complete the steam is blown off and a vacuum of at least twenty-two inches is formed until the desired amounts of air and moisture are removed. The steam heats the wood and loosens the fibers so that when the vacuum is drawn the air and moisture escapes more easily. After the vacuum, the retart is filled with creosote at a temperature of from 150° F. to 200° F. Pressure is then applied by means of pumps to force the preservative into the wood. After a sufficient amount has been injected, the oil is removed and a final vacuum is drawn to reclaim any surplus oil that might waste by dripping. The amount of creosote that should finally remain in the wood should be from five to twelve pounds a cubic foot depending largely upon the amount of sapwood in the timber treated.

Treatment in Place.

In the case of treatment for poles already in place, if the poles are

sound it is only necessary to remove the earth from around the poles for two feet below the ground line, allow the poles to dry out, clean the area to be treated, and apply two or three coats of hot preservative with a brush or spray. The spray is preferable if the surface of the pole is checked. The application should extend for twelve inches above the ground line. There should be time enough allowed between coats for the liquid to dry. Where there are weeds growing around the pole, the treatment should extend above their tops. The best time for doing such work is during the summer when the ground around the pole is driest. The cost of doing the work will be more than if the pole were out of the ground because of the extra digging, cleaning and backfilling.

In case the poles in position are already decayed it becomes necessary to do additional work, depending upon the amount or extent of the decay. If only the sapwood is decayed all that is necessary is to cut away the decayed portion making certain to clean out all cracks and checks and to allow the wood to dry. Some authorities on the subject recommend that as soon as the wood is dry that the exposed surface be heated with a plumber's torch to aid in killing any fungi that may be present at that time. Any part of the surface that may be become charred during the operation should be brushed away. The preservative is then applied as before. In any case, the back-filling should be done with fresh materials that do not contain these destructive agencies of decay. Some companies back-fill around the pole with eight to twelve inches of concrete bringing the surface slightly above the groundline. This tends to keep the surface of the pole dry and aids in preventing the pole's burning in case of fire in the adjacent weeds or grass.

In case the pole should be long enough to cut off and reset, the base should be surface treated as before, but it should be set in a new hole. The ground around the old hole is already infected with the fungus growth. One method frequently employed is to set a stub by the side of the weakened pole, binding the two together by means of wire. The stub, of course, should have some kind of preservative treatment before it is placed in the ground.

BELOW ZERO TRICK.

Government Scientists Observe Battery Reversal at Low Temperatures.

Washington, D. C.—When storage batteries or dry cells are cooled down to 170 degrees below zero Centigrade, the temperature of liquid air, these producers of electricity may reverse their voltage. This is the scientifically startling phenomenon that has been discovered at the Bureau of Standards, Department of Commerce, by two physicists G. W. Vinal and F. W. Altrup, who were making tests to determine the reliability of batteries at arctic temperatures. So far as is known, this is the first time this phenomenon has been observed.

A storage cell of the same material as used on thousands of automobiles every day was gradually cooled down and the open circuit voltages at the various temperatures were determined. Down to 80 degrees below, the voltage remained at the normal value just as it does in ordinary operation at normal air temperature. But between 80 and 100 degrees below, after the electrolyte had "under-cooled", it increased in temperature slightly as freezing began. The voltage dropped down to nothing at about minus-100 degrees Centigrade and then, at a slightly lower temperature, strangely registered a minus reading. Still more unexpected was the fact that there was registered as high as 10 volts in the direction opposite to the normal voltage. Then the voltage violently fluctuated ranging from positive ten volts to negative ten volts. These reversals happened whenever the frozen electrolyte of the cell "ticked".

A dry cell of an electric flashlight of commercial grade was given the same cooling treatment, and after giving slightly higher voltages than normal at 115 degrees below, it gradually reduced voltage until at 170 degrees below it reversed its voltage also.

But while the voltages shown under the sub-arctic temperatures are reversed and remarkably large, no hope is held out that storage batteries can be recharged by the simple method of cooling them to the low temperatures used in the Bureau of Standards' tests. The currents at these low temperatures are vanishing small, and practically they hardly exist, the tests showed. Just now the battery charging stations need fear no low-temperature competition.

The low temperature tests were begun to determine whether dry batteries would give reliable voltages at temperatures that would be encountered by the McMillain arctic expedition which recently started northward. The scientists of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington who were cooperating in this expedition also wished to know whether dry cells were fit for use after being frozen.

Dry cells of both the ordinary type and the silver chloride cells which were also tested at low temperatures appeared to be perfectly normal after being thawed out. The small-sized storage cell used also came through the cold without damage and even the glass test tube that contained it was unbroken. This phase of the tests is likely to prove of considerable commercial importance as dry cells that are used in cold regions and accidentally frozen can be relied upon, according to the results of the tests.

The knowledge of the behavior of cells at low temperature will prove useful in the case of flying at high altitudes where temperatures approach those of the arctic regions.

HOW TO SELECT AN INVESTMENT.

1. *Of what do the physical properties consist?*
2. *Can you actually see the properties?*
3. *What is the financial position of the company?*
4. *Do you know the character and reputation of the management?*
5. *Are the products or services supplied absolutely essential to the public?*
6. *What is the probable future demand for these products?*
7. *Are the earnings steady, or do they fluctuate?*
8. *Can the business continue under the stress of adverse business conditions?*

—J. F. Gilchrist to the Illinois Telephone Association.

Forests of Famous Blue Ridge To Get Phone Fire Guard.

Hagerstown, Md.—Through an arrangement made by the Bell Telephone company of Pennsylvania, the Chesapeake and Potomac company, and the forest officials, the Blue Ridge mountains are to have a comprehensive telephone fire protection system. Great activity in the principal industry of the mountaineers has brought with it a great fire,- and still greater firewater-risk.

ADEQUATE RATES.

Geo. Scoville Says Sufficient Rates and Good Publicity Are Prime Essentials.

Chicago, Ill.—TELEPHONE ENGINEER has a letter from George A. Scoville, sales manager of the Stromberg-Carlson Telephone Manufacturing company, from which the following is taken. In addition to what Mr. Scoville suggests, and supplementing Mr. Insull's thoughts, we may add that a very timely and helpful book called "Winning the Public," has just been published. Its author is S. M. Kennedy, vice president of the Southern California Edison Co., who is in charge of that organization's public relations and business development. We shall be glad to give our readers full particulars of this book on request.

"Lots of things can be done for the telephone industry, says George Scoville, "but the two main thoughts, in my judgment, that should be hammered home by a magazine are:

"An always adequate rate. Regardless of whether a company feels that it can get adequate rates or not, it must get them and might just as well start to work, now. Encouraging data is available, showing how different ones are getting rate increases.

"The next thought that should be burned deeply into the operating companies is the requirement of "publicity." They should be impressed with the thought of taking the public into their confidence and showing them their balance sheets as well as their troubles.

"As a rule, the public is square regardless of how we look at it. You can better get my thought by reading the address of Martin J. Insull before the Southwestern Electrical and Gas Association at Galveston, Tex. We have set up all the machinery in this country that we know how to, so as to protect operating companies and the public. For instance, we have uniform accounting requirements, as laid down by the Interstate Commerce commission, and this is a wonderful move in the right direction and tends to put all companies on an equal footing from the standpoint of maintenance. Also, we have set up utilities commissions, whose duty is to see that the utilities earn a proper return and that the public interests are protected.

"In the majority of cases today a man having the honor to be connected with a Utility in an official capacity seems to enjoy the distinction of being worse than a highwayman but not quite so bad as a bandit—if you can draw this fine distinction. The minute, too, that a Utility Commission allows an increase in rates, the public has a great variety of mud to cover them with. After all, though, the jury is the telephone using public." They are the ones to be satisfied if harmonious relations are desired.

"Let us urge these ideas on operating companies and tell them that the opening up of their books to the public is not enough. They must go out to the public and get them by the ear and lead them into their plant so that they may see and understand the telephone business insofar as it is possible for them to understand. They, at least, can thus get the fundamental principles and see the justness of the proposition. You can do untold good to the operating companies if you can get them to fight and put their business on a paying basis by efficient management and proper returns."

On another page will be found an extract from the excellent address of Martin Insull to which Mr. Scoville refers.

CHARLES W. MCKAY.

Contributions From This Author Start Next Issue.

We have just concluded arrangements whereby Charles W. McKay, author of "Telephone Rates and Values," one of the industry's best sellers, will start in the next issue of TELEPHONE ENGINEER a new series of up-to-date, informative articles on "Valuation in Rate Making." Mr. McKay also will conduct a regular department of this journal, entitled "Plant Engineering Problems." Questions of any kind pertaining to the plant will be answered in this department, in addition to a number of constructive contributions from Mr. McKay's pen, each issue. Be sure to have your own copy of TELEPHONE ENGINEER for February ordered in advance.

Almost Three Million New York Publicity Expense.

New York City.—W. F. Crowell, general publicity manager of the New York Telephone company testified that the company's directory expense for 1921 will be about $2,500,000. Advertising space sales in the directories amounted to $483,219. Average annual expense for newspaper and other advertising is about $350,000.

Bill Qualls, Veteran, Joins Federal T. & T. Staff.

Buffalo, N. Y.—W. F. Qualls, for 26 years a lively factor in the telephone business, has been appointed to the U. S. telephone sales staff of the Federal Telephone and Telegraph company. For seven years Mr. Qualls was general manager of the Decatur County Telephone company of Greensburg, Ind., installing the Automanual system for that company among his numerous other feats. He also sold Automanual equipment for a time. Later he figured on the staff of the Chicago Telephone company, and was contract agent for the Indianapolis Telephone company. In 1915 Mr. Qualls became associated with the Monarch Telephone Manufacturing company, from which company he came to the Federal.

Bristol Merger Creates 5000 Phone Company.

Bristol, Tenn.—Authorities in Bristol, Tenn., and Bristol, Va., have approved merger of the telephone companies in these cities. The new company will be known as the Inter-Mountain Telephone company and will have about 5000 subscribers according to Albert Parlette, president of the Bristol Telephone company. Much construction work is planned when the merger is completed.

Ohio Bell Again Big Buyer of Phone Property.

Columbus, Ohio.—The Interstate Commerce commission has approved purchase of 29 exchanges of the Chesapeake and Potomac Telephone company by the Bell Telephone company of Ohio. There are 26,000 subscribers involved in the deal. A $6,300,000 construction program for 1922 has been stamped O. K. by Ohio Bell directors.

New England Sleet Makes 100 Foot Line Weigh 87 Lbs.

Worcester, Mass.—Prof. Charles P. Brooks of Clark University estimates that the recent New England sleet storm made a 100 feet of telephone wire with its one and two-thirds inch coating of ice weight 87 lbs. He said 225 tons of sleet fell to the acre.

Ask Higher Rate to Buy Leased Plant in Texas.

Port Arthur, Tex.—A temporarily higher rate has been asked by the Southwestern Bell Telephone company to allow purchase of the plant now leased from the Port Arthur Telephone company.

Avoid Overhead Line Perils

Hazards of Overhead Lines in Telephone Service May Be Reduced to Minimum by Following Recommendations of Acknowledged Construction Authorities Says Expert

By M. G. Lloyd*

(Electrical Engineer U. S. Bureau of Standards)

The great majority of wires for telephone communication are strung upon poles and the overhead line may be taken as the typical method of construction for this industry. I shall, consequently, in considering the hazards which are involved in this industry, deal only with overhead line construction.

Hazards Involved.

In considering the hazards which arise as an incident to telephone service it is desirable to make a distinction as to who may be affected by them. In the first place there may be hazards to both persons and property. The property affected may be the telephone apparatus itself, or it may be buildings or their contents belonging to the general public. The personal hazards involved may relate to the users of the telephone apparotus, to the linemen employed by the company; or to the general public who may be affected by the construction of the overhead lines upon the public highways.

In considering the kinds of hazards which may arise we can distinguish between those of a mechanical nature and those of an electrical nature. In the category of electrical hazards I include shock and burns resulting from contact with conductors carrying high voltage; and the fires, burnouts, break-down of equipment, etc. arising mainly from foreign or excessive currents.

Among mechanical hazards we may list those due to poles or wires breaking down, falls of wiremen from poles, and such others as are not directly connected with abnormal electrical conditions. Included in these we should consider the interference with railroads due to any failure of the telephone construction at points where the line crosses railroad tracks. Thus a sagging line may be low enough to intercept a brakeman riding on top of a car, or a fallen pole may block the track.

Electrical Hazards.

There are two sources of electrical hazards which need be considered. One of these is lightning which by direct stroke or by its inductive effect upon the telephone line may cause abnormal voltages and currents. The other source of electrical hazard is a foreign electrical circuit which by direct contact or by induction may cause abnormal voltages or currents in the telephone circuit. The trouble usually arises through direct contact with power circuits. Inductive effects while possibly interfering with good telephone transmission are seldom so excessive as to induce voltages or currents upon the telephone line of a dangerous nature.

The latter condition does arise, however, in some cases where telephone wires run close and parallel to a very high voltage power circuit for a considerable distance, and is found principally where the power company operates a telephone circuit upon its own poles for its own use.

The enumeration of the sources of electrical hazards at once suggest the methods of protection for meeting these hazards. To meet troubles from lightning, fuses and lightning arresters may be employed for the purpose of carrying off dangerous electric charges to the ground and interrupting the part of the circuit which makes connection to the terminal apparatus and the users thereof. The same apparatus comes in for consideration in protection against high voltages of any other kind. In the case of circuits normally exposed to highly inductive effects, the use of drainage coils and transformers may be useful in shielding the terminal apparatus from high voltage; and the insulation of persons using this apparatus may be necessary. In other cases the grounding of exposed conducting parts of the apparatus will be a desirable safe guard.

The principal element of protection against high voltages arising from contact with power wires will be the maintenance of adequate clearances between the conductors of the telephone circuit and all foreign circuits. To provide and maintain proper clearances it is necessary that the conductors shall have sufficient strength to stay up in severe weather; that they be tied securely to the insulators which directly support them and that the crossarms, brackets and poles to which these insulators are attached shall also be sufficiently strong to resist the loads to which they are subjected, so that they will maintain the wires in their proper location through severe storms and other abnormal conditions. Similarly, proper strength of construction of the various elements involved in the support of the wires and the maintenance of their proper position is necessary at railroad crossings in order to avoid the hazards which are peculiar to such locations.

As above indicated, the use of drainage coils and transformers represents a very special method of protection which will seldom be called for except upon telephone circuits operated by power transmission companies and need not be gone into in detail at this time. The same remark applies to the insulation of persons using the telephone, since this will be necessary only in the case of lines which are normally subject to the imposition of voltages higher than is customary upon telephone circuits.

Grounding.

Where grounding is called for and ground connections must be made, as for instance to lightning arresters, care should always be taken to secure a good and permanent ground. The ground conductor should preferably be of copper wire and of a size sufficient to withstand mechanically any interference or abuse to which it may be subject.

* Paper presented at Illinois Independent Telephone association convention.

Where especially exposed, as upon a pole or the outside wall of a building, the ground conductors should be guarded from mechanical injury. The best ground is obtained when the ground wire is connected to a water pipe. In cases where a water pipe is not available it may be necessary to provide an artificial ground connection by means of pipe driven into the earth. When grounds of this type are provided, pains should be taken to provide a generous area of pipe to see that the pipe reaches into permanently damp earth. The ground connection used for telephone equipment should never be used also as a ground connection for an electrical supply circuit. Where connection is made to a water pipe it should be by means of an approved ground clamp and the surface of the pipe should be thoroughly cleaned where it is covered by the clamp.

Where the ground conductor is mechanically weak or is of a material which readily corrodes, there is danger that the ground connection will not be permanent and that it will not be in existence when the time arrives that it is seriously needed.

Fuses and Protectors.

The most important part of the protective equipment of a telephone line consists of the fuses and lightning arresters. These protectors provide a path to earth for high voltages of whatever origin which may occur upon the line, and the fuses are designed to function whenever the current flowing from line to terminal apparatus exceeds a safe amount, thus disconnecting the terminal apparatus from the line and protecting both apparatus and user from the hazards involved.

The range of conditions under which such protective apparatus can be expected to function properly is not generally known and some years ago tests were carried out by the Bureau of Standards in an endeavor to establish the facts in connection with this subject.

The proper functioning of fuses in telephone circuits is dependent upon a number of conditions, among which are the voltage imposed upon the line, the resistance, inductance and capacity of the circuit, since these will affect the amount of current which flows. There is also a definite difference in performance with reference to direct and alternating currents.

Ordinarily the resistance of the line is small and as the telephone apparatus is grounded, contact with another grounded circuit completes a short-circuit of low resistance and small inductance. Under typical conditions consequently the main factors to be considered are the voltage imposed upon a line and the nature of the current. For direct current it has been found that with voltages not exceeding 750 volts a fuse may be expected to function properly and interrupt the flows of current.

Without alternating current it is possible for the fuse to interrupt a much larger current and consequently one produced by a higher voltage. With voltages up to 4000 or 5000 volts the conditions will seldom be such that the fuse fails to properly perform its function. At higher voltages than this some doubt is introduced as to the proper performance of the fuse; nevertheless a large majority of the tests carried out in the neighborhood of 6800 volts show that the telephone fuse would function with satisfaction. However, the cases where a very large current was interrupted, such as would occur upon a circuit of unusually low resistance, there were a number of failures. It is evident then that the fuse is not so dependable in this range of voltage as at the lower voltages.

Clearances.

We have discussed above the functions and effectiveness of fuses and protectors in case abnormal voltages are imposed upon the telephone lines. In the case of telephone lines, however, as in other fields, an ounce of prevention is worth a pound of cure and the ounce of prevention in the present case is the maintenance of adequate clearances between the telephone line and foreign wires which may be carrying higher voltages. Clearances are important not only in avoiding crosses with other wires, however, but in providing safety for the linemen who may be working upon the poles. There are two elements in providing proper clearances. One is their establishment at the time the line is built and the second is the provision and maintenance of such supporting structures that the conductors will be permanently retained in their original position. The question of adequate clearances between telephone wires and power wires arises wherever lines of the two kinds cross each other, where they come in conflict upon separate lines of poles, and where the two classes of circuits are constructed upon a joint pole line. In all three of these cases the power line should be erected at a higher level than the telephone line and with sufficient distance vertically between them so that there is no likelihood of the two classes of wires coming into contact or that the linemen will come in contact with both at the same time. I wish to lay stress upon the statement that the power wire should be at the higher level and the telephone wire at the lower level. One reason for this is that power wires are usually of larger size and consequently less likely to break and fall upon the wires beneath. Another is that in cases of joint use of poles or overbuilding, this relative position makes it unnecessary for the telephone linemen to pass or come in close proximity to the power wires. A third motive for this construction from the standpoint of the telephone company is the element of cost, since it is the structures carrying the wires at the higher level which should be made strong enough to insure that the wires will not come down. If the telephone conductors are at the higher level this will usually represent a greater increment of cost due to the crossing conditions than if the power circuits are at the higher level.

I am pleased to note that the rules of the Illinois Public Utilities commission call for this arrangement of relative levels of the circuits operated by the two classes of utilities and I assume that practice in accordance with these principles is general in this state.

In order to provide for the safety of the lineman who climbs the pole it is necessary that a sufficient climbing space should be provided between the pole pins, so that the lineman may ascend through the lower wires to work upon those above; and it is also necessary that he should have sufficient working space to handle the wires upon any cross-arm where it may be necessary. This dictates a sufficient spacing between cross-arms and the avoidance of cluttering up this working space with vertical or lateral conductors or apparatus which it may be convenient to mount upon the pole. Your Illinois rules are in general satisfactory in providing the necessary elements of clearances, but I notice that it is permissible under your rules to run a vertical conductor on a joint pole mounted so as to be 5 inches away from the pole surface without any further protection to the lineman, no matter what the voltage carried by such conductors may be. This is not considered good practice in other localities. I might note also

at this point that your Illinois rules permit a clearance as small as one foot where a wire crossing involves circuits not exceeding 100 volts. In most places the minimum clearance permitted is two feet.

Strength of Construction.

I have pointed out above that even after clearances are initially established at proper values, it is necessary that provision be made for the strength of supports and of the conductors themselves such that these clearances will be maintained. Whether the juxtaposition of foreign circuits arises through a crossing, a conflict, overbuilding, or joint use, the line which is at the higher level should have the necessary strength of conductor and supports. If the telephone circuit is at the lower level its failure will not result in contact between the two circuits. Assuming that the power line is at the higher level the telephone company is then concerned to see that the construction of the power line is such as to protect his own line from possible contact.

In the first place the conductor itself should be strong enough to carry the loads which may be imposed upon it. The maximum load which is usually assumed in this part of the country is that arising from a weather condition which will deposit upon the wire sleet or ice to a thickness of one-half inch radially, and accompanied by a wind of such velocity as to exert a pressure of eight pounds per square foot upon the exposed surfaces. To carry such a load it is necessary that the conductor shall have sufficient cross section to give the desired strength and that it shall be made of such material as will not readily corrode and thus gradually diminish its effective cross section and strength to the breaking point.

Copper is the material most generally used for power conductors and it should be limited to a definite minimum size. For circuits of less than 5000 volts No. 6 soft drawn wire is the minimum permitted. For circuits of higher voltage a No. 4 soft drawn copper or No. 6 hard drawn is the minimum.

The next element in proper strength of construction is the support of the wires at the crossarms and the use of crossarms of adequate strength.

Finally the pole or other supporting structure should either have sufficient strength in itself to resist the loads that may be placed upon it by the standard weather condition already referred to, with a suitable factor of safety; or else it should have the additional support of guys to assist in carrying this load.

Joint Use of Poles.

The same requirements for strength are made at crossings, conflicts and cases of overbuilding or joint use of poles, since all of these cases involve the possibility of the wire at the higher level falling and making contact with the circuit at the lower level. Crossings of course cannot be avoided, but conflicts and overbuilding frequently can be avoided and should never be tolerated when such avoidance is possible. The overbuilding of one line by another is particularly objectionable. It involves all the objections which apply to the joint use of poles by two utilities and at the same time brings additional possibilities for the reduction of clearances since the two sets of wires are not mounted upon the same rigid structure. From the standpoint of cost a joint pole line clearly has the advantage. There consequently appears to be no engineering or economic justification for overbuilding and the alternative of joint use of poles is to be preferred under any and all circumstances.

A conflict of two lines which are sufficiently separated so that a broken wire upon one is not likely to fall upon the other represents a different case. The same strength of construction will be necessary for the taller line as in the cases of overbuilding or joint use of poles and consequently from the standpoint of cost of construction alone the joint use of poles is to be preferred. In this case, however, there is no lessening of hazard by combining the two lines into a single pole line and in cases of very high voltage it may be advantageous for operating reasons to keep the two lines as far separated as possible even though a conflict is necessarily involved.

Railroad Crossings.

The hazards arising at a crossing of telephone wires over railroad tracks have been pointed out above. The essentials to a safe condition here are again, sufficient clearances of the wire above the track and sufficient strength of the wire and its supports to maintain this clearance. A minimum size of wire is consequently specified as well as a minimum size of crossarm and the use of guys to support the pole and insure that in case it should fall it will not fall over the tracks.

The Illinois rules call for a head guy and two side guys at each crossing pole, the guy strength to be not less than 3800 pounds. In the National Code it is provided that side guys may be omitted when the pole alone has a factor of safety of 4. Head guys may be omitted if there are not more than two wires in the crossing span and the pole alone has a factor of safety of 2. Otherwise guys are required and their strength and number are determined by the actual load which must be carried by the pole. This in turn depends upon the number of wires and the length of the span. In many cases of heavy loads a 3800-pound guy will not be sufficient to give adequate strength.

The Illinois rules prohibit the use of brackets at crossing spans. The National Code permits their use provided they are used in duplicate so that there are two points of support for each wire at each end of the span.

The telegraph and telephone section of the American Railway association has drawn up a complete specification for signal wires crossing over railroad tracks which is in conformity with the National Electrical Safety Code and which will supplant the previous specifications of that organization. These specifications include tables of the necessary strength of both head guys and side guys under various conditions.

Operating Rules for Linemen.

Having obtained the construction which will so far as reasonably possible insure against crosses between power circuits and telephone circuits and which will insure as far as possible against contact of telephone linemen with power circuits on joint poles, it then becomes necessary to see that operating conditions are maintained properly and that linemen who must ascend poles carrying power wires take the necessary precautions. I shall not attempt at this time to go into detail with respect to the rules which should be followed by telephone employees in operating their equipment and maintaining their lines. Let it suffice here to refer to Part 4 of the National Electrical Safety Code in which this matter is covered in detail.

National Electrical Safety Code.

I have given in the preceding paragraphs the considerations which should govern the construction of telephone lines and the power lines where the latter create a hazard with respect to telephone lines. These are

the considerations which should also determine the requirements to be included in any set of regulations governing this type of construction. The Bureau of Standards has been giving this matter attention for a number of years and has drawn up a set of rules covering this subject which are the result of a lengthy study of electrical accidents; of present and past practice in the electrical industry; and of the possible methods of improving that practice. These rules are known as the National Electrical Safety Code, which is now in a third edition and has been perfected to the point where we consider it suitable for mandatory application to the industry. Part 2 of this Code covers the construction of overhead lines and a considerable part of it has been utilized in the regulations of the Illinois Public Utilities commission under which you operate. The Commission, has, however, added some additional rules and has departed in some respects from the requirements of the National Code. It has also applied the same rules to circuits exceeding 5000 volts as to those exceeding 7500 volts. In most other jurisdictions, however, the state authorities are following the National Electrical Safety Code more closely and in a number of cases have adopted the rules verbatim. Strict adherence to the rules of the National Code have the benefit of providing national uniformity in the standard of construction, which is especially advantageous to those utilities whose lines cross the state borders. Another advantage which we feel results from the use of the National Code is that it covers a number of points which are likely to be omitted in rules adopted locally, which are consequently more or less incomplete and which do not attain the same reasonable balance between all the elements of construction which go to make up the complete safety of the electrical installation. I have already pointed out some items in which your Illinois rules appear to me insufficient and I might merely call attention in addition thereto that the Illinois regulations make no requirement whatever for the strength of poles on power lines of less than 5000 volts a.c. where they cross telephone circuits or are run on the same poles with them.

HERE'S HOW.

Sheldon, Ia. Company Gives A Lesson in Good, Strong Advertising.

Sheldon, Ia.—A reminder of a telephone company's problem in anticipating community growth, and the financial strain placed upon the company by reason of this factor, has been presented to Sheldon citizens by the Western Electric Telephone system in one of the most attractive and convincing telephone company advertisements of the month.

The Sheldon advertisement runs 10 inches deep on three columns and uses plenty of white space to give a dignified, inviting appearance. The head reads, "Your Future Needs". The body of the advertisement says:

"We try to have the wires in place, the switchboard equipped and other intricate mechanism ready so that when a new telephone is order ed, service can be provided with the least possible delay. In order to do this economically, our engineers must estimate, for years in advance the number of telephone users there will be, where they will live and how much telephone equipment they will need.

"From 1890 to 1910 Sheldon had its most substantial growth increasing in population considerably over 100%. Our list of subscribers during the same period increased nearly 400%, yet we were able to take care of this extraordinary telephone development. Suppose the Telephone Company had not anticipated the growth of Sheldon many years fn advance, what would have been the telephone situation today? instead of one of the best improvements ever made in Sheldon by a public service corporation, there might have been a demoralized telephone situation with facilities years behind the times and the public demanding service not possible to deliver.

"During the life of our new telephone exchange just completed Sheldon will no doubt reach a population of from five to six thousand people. There will be hundreds of homes built in many new additions, factories will be built, jobbing interests will be enlarged and many new office and store buildlings will be erected. These improvements will require the expenditure of millions of dollars. None of these investors will ask if the Telephone Company is prepared to take care of their telephone requiremnts. Our ability to serve is taken for granted. We must be prepared."

Phillips In Solid as Booster of His Native Heath.

Lubbock, Tex.—H. D. Phillips, local manager of the Southwestern Bell's property is known as Lubbock's foremost booster. He is the one who paid tribute to New York City as the "Lubbock of the North." They sure give the telephone man credit for his boosting, as evidence read this from the Lubbock newspaper: "He is not at all timid in expressing his opinion of the difference in the country surrounding Lubbock and that of the places visited, and we are sure he was on the job boosting Lubbock, the entire time he was away. We admire men like Mr. Phillips, and to the spirit of his life, we attribute a large part of our progressiveness. Lubbock and West Texas is a going concern, and such men as Mr. Phillips are the cornerstones of our structure."

C. H. Rottger, New Indiana Bell Chief.

Indianapolis, Ind.—Curtis H. Rottger has been elected president of the Indiana Bell Telelphone company to succeed Edgar S. Bloom, who has been elected chairman of the board of directors. Mr. Rottger began his telephone career with the Central Union company in 1882, working as night operator and switchboard man, while attending high school during the day. During his 39 years in the telephone business Mr. Rottger has held positions in practically every department of the industry.

Southern California Doubles Last Year's Record.

Los Angeles, Cal.—With 26,000 telelphones connected this year, representing a gain of 13,000 more than last year, the Southern California Telephone company is making a record worthy of note. A 10 story $1,000,000 building is planned for the company. It is expected this building will be completed by September 1, 1922. A deficit of $431,925 during the first nine months of 1921 is the sad part of the story. The company is going to the public with a plea for support in its request for a direly needed rate increase.

Idaho Cities to Get Slice of Pacific Improvement Money.

Lewiston, Idaho—This city is to be the beneficiary of a $10,000 line rehabilitation campaign of the Pacific T. & T. Co. Clarkston is to see a $13,000 construction campaign under way in the near future.

Vail "Down But Not Out"

Albert Bigelow Paine's Biography of Telephone Chief An Absorbing Narrative of Long Gambles, The Stiff Upper Lip and Final Hard Won Triumph

Albert Bigelow Paine, biographer of Mark Twain, has added another masterpiece of biography to his string with his new book, "In One Man's Life," a biography of Theodore N. Vail. This book is published by Harper and Brothers, to which firm and the Boston Sunday Post, acknowledgement is due for permission to publish the following high spots in Theodore Vail's remarkable career. As a young man Mr. Vail held an important position in the Railway Mail service in Washington. Gardiner Hubbard of Boston, Bell, the inventor, and Watson, his Boston friend, wanted an organizer to put on the market, what was then a mere plaything, and start it as a regular business. They offered the place to Vail and he accepted, resigning his position in Washington. What followed is described by Mr. Paine in these words:

"The announcement of his tendered resignation created quite a stir in Washington; scarcely one of his friends but believed that he was giving up a career for a rash adventure.

"Uncle Joe" Cannon, then a young member of Congress, was quite confounded by the news.

"Vail resigned his place!" he exclaimed when they told him. "What for?"

"Why, he is going into that thing invented by Bell—the telephone that talks over a wire. He has invested some money in it, and is going to make it his business."

"Well," said Cannon, "that's too bad. I always liked Vail. Hubbard tried to sell me some of that stock. I'm sorry he got hold of a nice fellow like Vail."

"Throw Up the Yankee Notion!"

"Cannon was not the only one in Washington who expressed regret. First Assistant Postmaster-General Powell wrote with a good deal of warmth:

"I understand you intend resigning your present position for the purpose of entering upon the duties of superintendent or president of a company known as the 'Telephone Company.' If there is any truth in the rumor my only wish is that you may have—before acceptance of your resignation by the P. M. Gen'l.—a telephone tube fastened to your ear and another connecting at the top of your head with a wire running perpendicular or horizontal, and while in this condition be compelled to listen to the sweet-by-and-bys of every yelping canine and the solos of all the tom cats in the State of New York Telephone Well, it may be useful as well as ornamental but listen to the prophecy of an old fool to a friend. One or two years hence there will be more telephone companies in existence than there are sewing machine companies today. * * * For T. N. V. to accept the superintendency of a Yankee notion in preference to the position he now holds is certainly laughable. I can scarcely believe that a man of your sound judgment, one who holds an honorable and far more responsible position than any man under the P. M. Gen'l., with honor and respect attached to the same, should throw it up for a d—— old Yankee notion (a piece of wire with two Texan steer horns attached to the ends, with an arrangement to make the concern blate like a calf) called a telephone! * * *

Nobody Wanted the Phone.

"At moments their case seemer desperate; Vail one day ordered a small bill of supplies from L. G. Tillotson & Co. of 15 Dey street, New York. They failed to come and a porter was sent after them. He returned presently with the word that the firm would be glad to send over the articles as soon as they had received the cash for them, something under $10. Curiously, it happens today that the big building of the New York Telephone Company stands on the site of Tillotson's store.

"Theodore Vail's calmness during these early trying days was a large asset. Devonshire (his secretary) and others of his force, dismayed at the financial situation, and at the powers in array against them, would look over at him sitting at his desk, serene, undisturbed, quietly writing, and take courage.

"He had been too many years in Washington, with storms brewing and breaking around him to waste time and nerve tissue now walking the floor. Besides, he was not of that cast.

"Devonshire made up his mind that nothing could disturb Vail. He could even, while writing, steadily carry on an almost continuous conversation—a faculty which deeply impressed those about him.

"They noticed, too, that he never seemed to have the least misgivings as to the future. He planned for it, but always as if it were a certainty. He crossed no bridges till he came to them, and then always with a confidence that stimulated and sustained those around him. Once long afterward when he spoke of that time he was asked:

"Didn't you ever get discouraged?"

"If I did," he replied, 'I never let anybody know it."

And somehow we feel that he never did.

Telephone Girls in Early Days.

A report made by "Inspector" Lockwood to General Manager Vail, some months after the latter's arrival in Boston, may be found rather amusing in its picture of conditions at that early period. Extract reads:

"(2) The operators are all females which of course has its advantages and disadvantages, which here it is unnecessary to comment on, barely mentioning the fact that notwithstanding the pronounced opinion of resident authorities that female operators are much superior to males, the fact remains, viz.: That the office manager, unless an unusually well balanced man, is liable to form preferences, and favor some to the exclusion of others. The young ladies also appear fond of airing their voices, and sometimes prolong telephone conversation, to talk with subscribers, again losing time. On the other hand, they exceed males in civility and general attention to their own tables.

(3) I also notice that the switch boys frequently make mistakes in connections, and am informed by a switchman that sometimes seven min-

utes elapse before the parties get to conversing with each other, and that sometimes a man had to wait so long that he had forgotten his call.

Vail Loses His Fortune.

Mr. Vail invested in all sorts of schemes—some weird inventive ideas that he tried to promote. The hundreds of thousands of dollars he had saved from telephone stock disappeared.

"He had sold his yacht, the Norna, a year earlier when the demand for funds had become urgent. He now decided to dismantle and sell the Walnut avenue house in Roxbury, Mass. He placed a number of his most valuable pictures on sale, and shipped several carloads of the handsome furnishings to the Vermont farm, which, for the sake of both health and economy, he now determined to make his home.

"His misfortunes were not yet ended. For the largest and most important of these, the Accumulator Company, he still had hopes. It was one night at dinner, when he was about ready to leave for Vermont, that his butler, William Johnson, handed him a telegram announcing the fact that the Accumulator had followed the rest. Mrs. Vail was in Newark; he was dining alone in the dismantled house; he only laughed.

"'Well, Johnson,' he said, 'the Accumulator is busted. Where is the next crash coming from? Bring a bottle of champagne.'

"The 'next crash' was the announcement, a day or two later, that the firm to whom he had consigned his pictures—about $70,000 worth—had made a bad failure; he would receive a little or nothing for his property.

"Certainly he was not crushed, not defeated. His fortune was badly crippled, his health damaged. No matter, he would get back his health and make a new start. He was less than 45, a young man, and there was plenty to be done in the world. His debts were paid and he still had the farm.

Again Millions Flow In to Him.

But Vail had invested heavily in one thing that went down to about nothing in value and then suddenly recovered itself and Colorado and South America restored his fortune.

"And now, having done so badly by him, and seeing his still unbroken spirit, fate would seem to have relented, for—surprise of surprises—the old Colorado mine, the Pelican and Dives, long since given up as hopeless, all at once began to pay. A new richer vein had been developed and money came tumbling in. Once, a few years earlier, he had shown his sister Mary a great bundle of stock certificates, and jokingly offered to sell them to her at something like 10 cents a share. Now they were all valuable again.

"The summers of his later South American prosperity were periods of royal entertainment at the farm. Parties from Boston and New York were always coming up; elaborate driving excursions were of daily occurrence.

Fortune Teller Right.

"He had a poor regard for political methods. Five years before in Paris a fortune teller had assured him that his greatest work would come after he was 60, a prophecy that had been repeated by a fortune teller in London. He had taken little stock in these predictions, and there seemed slight promise now of their fulfillment. Certainly he did not dream that his destiny was about to be realized.

Back Into Telephone Again.

But now the South American investments brought in their great wealth and the telephone company called him back to the presidency.

"The year 1907 was an eventful one in the business world. For many it was a disastrous year.

"Whatever Vail thought of the future, his immediate judgment was to sell his South American properties. He received something more than three million dollars for his holdings, and those who had joined their fortunes with his profit accordingly.

"Now the bankers recommended making Vail president of the telephone company and bringing the offices from Boston to New York. They acquired 50,000 shares of telephone stock and caused an investigating committee to be appointed with Theodore Vail at its head. The result showed that the company's affairs were, in fact, involved. A large amount of money would be required for immediate use and a still larger sum by the end of the year.

But Vail took hold energetically, straightened out all the finances and work "Telephone" again a name to conjure by in business and in finance.

"He lived until April 16, 1921, when he died at the age of 75."

AD. IN A POEM.

Music of Voice Inspires Bard to Write Big Telephone Advertisement.

Detroit, Mich.—An entire advertisement devoted to a poem is a novelty, but novelty is what puts across an advertising message, so the Michigan State Telephone company took a chance.

The chance panned out well. "Voices" a poem written by Emanuel G. Frank appeared in the list of papers the company is using through Michigan. At the top was an illustration of a man reaching for a telephone and in a phantom effect was a family group with the daughter lifting the receiver.

The poem goes:

VOICES

By Emanuel G. Frank

There's a wondrous thrill of pleasure
When you see the form and face,
Of some loved one in whose presence you rejoice;
But the joy there is in seeing
Can't compare with what takes place,
When you hear the magic music of her voice.

Be it mother, wife or sweetheart,
Be it sister, daughter, friend,
As within your waiting vision each appears;
While your heart may leap to see them
What is better in the end,
Than their eager voices sounding in your ears.

But remember as you listen
That these sweet and nameless thrills,
Find an echo and an answer rich and true,
In the hearts of cherished loved ones
Which alone your voice fulfills;
For when all is said, your voice is really you.

So when travel takes you from them
Let them feel how much you care,
Let them know you haven't left them all alone;
Let them feel in fullest measure
You, yourself, are standing there;,
Let them hear the voice they cherish through the 'phone.

Training the P.B.X. Operator

Boston's Bureau Assures Operating and Mechanical Satisfaction by Hiring, Training and Supervising Girls in Whose Hands Is Placed Company's Reputation

By E. F. Hersey

Supervisor in Charge of Private Branch Exchanges
Metropolitan Division New England T. & T. Company

The ever-increasing growth of private branch exchange systems in Greater Boston, with its consequent influence on traffic in the Metropolitan division, has made the work of our private branch exchange bureau of paramount importance, not only as it affects the subscribers to such systems, but as it effects service as a whole.

This bureau was established in February, 1905, and was directly due to an accumulation of service difficulties, both from an operating and mechanical standpoint that seemed to justify the need of the specialization of this particular part of our service. At that time, in what is now the Metropolitan division, there were 749 P. B. X. systems, to which were connected 2,768 trunk lines and 11,623 extension line stations. Today we have 3,757 P. B. X. systems, 13,567 trunks, and 66,552 stations.

The large number of stations mentioned above means that P. B. X. business represents a large fraction of our total traffic. Beach, for instance, shows 35 per cent of its business due to calls from and to P. B. X. systems. This fact alone shows the necessity of specializing in this branch of our service; of bringing the subscriber, the P. B. X. operator, the central office force, and the Plant and Traffic departments in constant touch with each other; of co-operating to obtain the maximum grade of service. It is a fact that even one operator on a small branch exchange who does not co-operate with our central office force can be a considerable handicap to efficient service.

Young Women Supervisors Visit Subscribers

The medium through which this co-operation is obtained is the P. B. X. Bureau. Apart from having at its finger tips the type and location of each P. B. X., the number of trunks, tie trunks and extension line stations associated with each, the bureau employs five P. B. X. supervisors whose principal duties are to visit every new installation for the purpose of giving proper instruction to the operator, and to any person who may from time to time relieve her. In this way a relationship is established immediately upon the installation of the service, showing the new subscriber what we are endeavoring to do and just how we are able to assist him in getting the maximum amount of service from his equipment. These supervisors continue this relationship by general inspections of the board once every two months, and by special inspections in case of serious trouble reported either by the subscriber or by the chief operator. The young women employed on this kind of work must be diplomatic, especially when observations have shown that the service difficulty is due to improper operation of the P. B. X. or lack of co-operation on the part of its operator. In cases of this kind it becomes the duty of the supervisor to point out to the subscriber that the trouble is not with the Company but with his operator. Their success in performing this part of their duty is shown by the fact that although the number of P. B. X. operators is always increasing, the cases of trouble of this kind are fewer than ever before. One of the biggest factors in bringing this about is an arrangement made by the supervisor that enables the P. B. X. operator to visit the central office and become acquainted with the chief operator and supervisors, and obtain a more thorough knowledge of central office work. Usually these visits result in complete understanding and perfect co-operation on both sides.

The bureau also employs a corps of traffic inspectors, whose duty it is to take charge of the engineering of equipment at stations where P. B. X. switchboards are to be installed. They consider all phases of the needs of the new subscriber, his business relations, the number of his force, the extent of the territory with which he will be in touch, etc., and recommend equipment to fill his requirements.

These men also engineer larger or additional equipment. Such equipment is determined by peg counts equated by the use of coefficients in much the same way as are peg count studies of the central offices, but with some modification. For instance, in some P. B. X. systems the operator is almost entirely mechanical, simply answering inward calls and connecting the desired station, or, in the case of outward calls, plugging into a trunk jack and letting the calling party pass his own call to the central office operator. In other systems a subscriber will pass his call in some such manner as this: "Get me Jones & Co." and hang up at once. In a case like this, his operator must find Jones and Company's number, pass the call, get Mr. Jones on the wire and ring back to her employer when Mr. Jones is ready to talk. It can be readily understood from the above examples that the same coefficients could not apply in both cases and that there are many intermediate steps between these two extremes. It is necessary, therefore, that the traffic inspectors have a personal knowledge of the method of operation at the system where the data is being obtained. In this connection, the judgment of the P. B. X. supervisor in that district is largely relied upon when making estimates for needed equipment.

Another of the numerous duties of the traffic inspectors is the accumulation of service observations in connection with complaints made by the subscriber, or difficulty experienced by a chief operator. These observations are summarized and given to the P. B. X. supervisor and to the subscriber for their information.

Not the least of the difficulties experienced by these inspectors is the attitude of would-be P. B. X. subscribers on the question of the location of the board. It is surprising to see the number of representative business men who do not hes-

itate to spend any amount of money recommended by our commercial and traffic managers to buy adequate telephone service, but who think that a basement, a loft, or even a closet is a good enough place to locate the board, without giving a thought to the attendant who must sit at it throughout the business day. It is pleasing to note, however, that in this question—light, air and room, as in all other questions, the subscriber is more and more inclined to accept the recommendations of the telephone expert rather than to rely upon his own judgment.

One of the most important functions of the P .B. X. bureau is its ability to supply competent and experienced telephone operators for P. B. X. systems, and, for this purpose, a list of available operators is maintained by the bureau. The names of the applicants are taken at the bureau's office, and, if their past record with the Company is good, and if references are satisfactory, they are placed on the waiting list. During the past year a large number of our subscribers have appealed to us when in need of an operator either for permanent or temporary work. During the vacation period of last year (1920), 283 substitute positions were filled.

Operators Trained at Special School

Following the logical line of development in the work of supplying operators, it became evident in the early part of 1920, that a small school, where it would be possible to train applicants, especially for P. B. X. work, would be beneficial in more ways than one. For instance, a large number of the smaller systems did not have a regular operator, but used a clerk or some other employee already in the organization. The factor of inexperience is always a point to be considered in the development of service and if this factor could be eliminated to any extent, the improvement would be marked. Accordingly, such a school was recommended, and on May 17, 1920, was opened under the supervision of the P. B. X. bureau. The assistance and hearty co-operation of the manager of the Training department made possible the training of about 45 operators during the summer months. Due to the period of business depression, it was temporarily closed in September, but was opened again in April, 1921, and continued its useful work.

The employment bureau is at the disposal of both the applicant and the subscriber without charge to either, and the closer relationship and the co-operation thus established is of great value to the Company. Especially is this true because such relations are the natural development where the operator obtains her position through the Company and where she has either worked for or been trained by the Company.

In order to inform the subscribers of the great help the P. B. X. bureau can be, a personal letter has been sent to each subscriber, explaining the desire of the Company, through its private branch exchange bureau, to obtain for him a maximum efficiency from the equipment which he has installed, and calling his attention to its ability to furnish an experienced operator to handle his board. Letters have also been sent out calling attention to other bureau service—its supervisors and inspectors and volunteering to supply information or assistance desired. These letters are followed up by personal calls by the supervisor, who makes sure of the receipt of the letter and emphasizes to our subscriber the ability and desire of the Company, through its bureau of specialists, to assist him in receiving a satisfactory grade of our product through his telephone door. The results of these efforts have always been satisfactory and in a great many cases have more than fulfilled their object.

In addition to the above, all of the Company's attended pay stations, 12 in number, being essentially P. B .X. systems, are under the supervision of this bureau. These stations are located in the railroad stations and several of the more important hotels. The operators employed are regular Telephone Company employees, and are directly under the supervision of the pay station supervisor. In connection with these stations, the bureau maintains a lost and found department, where articles have been turned in, varying in value from an empty card case to a wallet containing over a hundred dollars in bills. Every effort is made to find the owner and the results are in some cases uncanny. The slenderest clues are followed up and fully eighty per cent of the articles are restored to the owners.

It can be seen from the above the truth of the old saying that "Large oaks from litle acorns grow." Because of an unsatisfactory traffic condition in a single branch of our service, this bureau was formed.—*Telephone Topics.*

ON A PLATTE-R!

Valuable Publicity Presented to Platte Valley in Letter Newspaper Prints.

Scottsbluff, Neb.—Proof that many telephone companies do not take advantage of the publicity opportunities that are afforded them in the new columns of local papers, may be had from a lengthy letter written by Eben D. Warner, president and general manager of the Platte Valley Telephone company to the editor of the Scottsbluff Republican.

Warner gracefully acknowledges the newspaper's tribute to the company's service and gives news of the utility's plans that is of interest to the community. He got a full column of the finest kind of publicity for the company gratis, as a result.

In his statement, Warner outlines the company's p'ans, and its present condition. He writes:

"We have within the past eighteen months added many thousand of dollars to our plant investment in providing additional copper circuits to provide for fast toll service.

"The following exchanges have been rebuilt and converted in common battery exchanges: Gering, Nebraska, and Torrington, Wyoming. Complete new cable plant systems have been built at Lewellen, Lisco and Broadwater and Yoder, Wyoming as well as other numerous other extensions on local lines. Provisions are also being made to convert the present magneto exchange at Scottsbluff to common bat ery, already the new switchboard and material, except cable, have been delivered and in storage in the city, and just as soon as financial conditions warrant without great financial risk to the company we will proceed with the change.

"We have also arranged with the Associated Bell Companies namely, the Northwestern Bell company which meets us at Bridgeport, Sidney, Alliance and Ogallala, and the Mountain States Telephone and Telegraph company which meets us at Wheatland for single ticket methods of passing toll cards."

Wanted: Position as wire chief, superintendent, or manager, or combination of these on small exchanges. Twenty years' experience. Address F. R. S. care of TELEPHONE ENGINEER 28 E. Jackson Blvd., Chicago, Ill.

Type A 27 Pole Cable Terminal

Type A 27

FITS POLE
NO GAINING

Will Give Relief
From Fuse Contact
and Carbon Troubles

Phosphor Bronze Fuse Clips
That Bite Through Corrosion
to the Clean Metal

EMPLOYS NO. 27 STANDARD FUSE—CUT IS FULL SIZE

HOT GALVANIZED COVER—LASTS LONGER

The Cover is made from Black Sheet and then dipped in Molten Zinc, which gives a Continuous Unbroken Zinc Coating.

LOTS OF ROOM TO DRIVE LAGS

Equipped with P495 Sawtooth Discharge Blocks

Reliable Electric Company 3145 Carroll Ave., Chicago, U. S. A.

COMMITTEE REPORTS.

Electrolysis Authorities Issue Findings of Harmony Sessions.

New York City. — The American Committee on Electrolysis has just issued its 1921 report, superseding its preliminary report of 1916. This report embodies such statements of facts and descriptions, and discussions of methods of electrolysis testing and electrolysis mitigation as the members of the committee have been able thus far to agree upon unanimously. In the preface, signed by Bion J. Arnold, Chairman of the committee, the following statement is made:

"While this report supersedes the preliminary report of 1916, it should, unless the principals see fit to discontinue the work of the main committee, be considered as in the nature of a progress report and not as final, as it is impossible at the present time to finally answer many of the outstanding questions involved. Also it is to be understood that the report is confined to the technical and engineering aspects of the subject and does not attempt to deal with matters of policy or with legal questions, such as the rights and responsibilities of the several interests concerned."

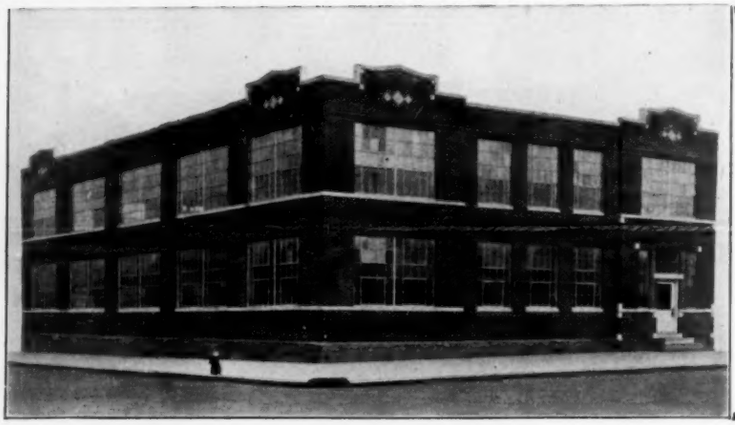
The report comprises five chapters. Chapter One sets forth a rather full statement of principles and definitions. Chapter Two is devoted to a somewhat detailed discussion of the design, construction, operation, and maintenance of railways and underground structures affected by electrolysis, and to a discussion of questions involving the interconnection of affected structures and railways, ending with a summary of good practice as agreed upon by the committee. Chapter Three gives a discussion of the fundamentals of the whole question of electrolysis surveys, their purpose, scope, possibilities, and interpretation, and also a discussion of the instruments suitable for electrolysis testing. Chapter Four is devoted to an analysis of present European practice relating to electrolysis mitigation. In chapter Five the committee outlines certain researches which it deems necessary to have carried out in order to make it possible to reach a final solution of some of the fundamental questions pertaining to electrolysis mitigation.

The American Committee on Electrolysis which prepared this report is a joint committee having three representatives from each of the following organizations: American Institute of Electrical Engineers, American Electric Railway Association, American Gas association, American Railway Engineering association, American Telephone and Telegraph company, American Water Works association, National Electric Light association, Natural Gas association, National Bureau of Standards.

Arrangements have been made for placing this report on sale by the American Institute of Electrical Engineers, 33 West 39th Street, New York, N. Y. The price is one dollar a copy.

Take Cuss Out of Discussion Or Lose Phone, Judge Says.

Urbank, Minn.—Judge W. L. Parsons has upheld action of the Effington Telephone company which discontinued service to a subscriber whose profanity and abuse was poured into the telephone. The ex-subscriber's suit for $2,000 damages was dismissed.



OUR NEW HOME

Equipped With Every Modern Facility for the Manufacture of the Highest Grade of Electrical Measuring Instruments

Indicating Rail Bond Testers—Ohmmeters, Test Sets, Galvanometers, Etc.

Put your testing and measuring problems up to our engineering department

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Central Agent
The J. W. Murphy Co.
108 So. La Salle St., Chicago

Pacific Coast Agent
King Knight Company
Underwood Bldg., San Francisco, Cal.

Oregonians Hold Lively Meet at Portland.

Portland, Ore.—About 30 independent telephone companies were represented at the seventh annual convention of the Oregon Local Telephone association, held here in December.

Whether the telephone directory should be made a source of revenue or expense was a subject featured by a lively discussion. The topic was opened by F. H. Bingham. "Depreciation and Obsolescence" was the paper read by E. T. Busselle, Salem. At the luncheon delegates were addressed by L. L. Phillips, transmission engineer of the Pacific Telephone & Telegraph Company, on the subject "Transmission Efficiency and Inductive Disturbances." The following officers were elected for the ensuing year: C. E. Wells, Hillsboro, re-elected president; G. A. Bauman, Forest Grove, secretary-treasurer; and E. W. Gates, Mashfield, S. D. Crowe, La Grande, J. H. Hessig, Port Klamath, C. H. Miller, Redmond, and T. L. Brown, Silverton, vice-presidents. New directors were also chosen. They are: H. J. Roake, Portland; E. E. Goff, Newberg; A. J. Vance, Medford; W. H. Logan, McMinnville; and J. E. Smithson, Hood River.

Enlist Operators in Planning Better Service in 1922.

Philadelphia, Pa.—Almost 13,400 operators of Bell companies in Pennsylvania, Delaware and southern New Jersey were represented during a recently completed series of meetings conducted under the direction of M. B. Downing, general superintendent of traffic of the Bell Telephone company of Pennsylvania. The purpose of the meetings was to show how the company's service could be improved in 1922 by raising operators' standards of performance.

YOUR IMPORTANCE.

Perhaps I have been able to make more vivid to you the importance of the work in which we are engaged. It is ours, as opportunity and as responsibility. The telephone had its inception in America. In respect to invention, engineering, manufacturing and operation, the American telephone system has been the pioneer for the entire world. It has set the standards. In no other country has the telephone been developed so that it can be used by so large a proportion of the people, or so steadily through the 24 hours of the day and the 365 days of the year. Nowhere else is the service so good or so cheap. In the fame and in the responsibility of these achievements you participate. To carry on the work to a still more perfect service is your privilege, and the privilege of your associates and successors. And furthermore it is your great responsibility.—*President H. B. Thayer, A. T. & T. Co., to the Telephone Pioneers at St. Louis.*

Todd Figures as Benefactor to Maryville, Mo., Men.

Maryville, Mo.—A. C. Todd, head of the Hanamo Telephone company of this city is a leading factor in a local movement to make Maryville men appreciate the telephone as never before. Todd, and other leading citizens have organized the Maryville Country club and intend to be playing on a golf course laid out by Jas. W. Watson of Kansas City, in the spring. Wait until Maryville matrons begin getting telephone calls informing them that important business will detain their husbands. Then the country club men will agree that Todd's business made the club possible.

New England Storm Cost Million and a Half Dollars.

Boston, Mass.—December's sleet storm cost the New England T. & T. company $1,500,000. During the 10 days immediately following the storm 100,000,000 feet of wire was laid on the ground or attached to fences in restoring service. More than 3,000 men on long hour shifts were engaged clearing the wreckage and restoring service.

Bell of Pennsylvania Shows Substantial Increase.

Philadelphia, Pa.—A gain of 7.8 per cent in number of telephones in use in 1921 over the 1920 figure has been made by the Bell Telephone company of Pennsylvania, in announcing that the average number of phones in use during 1921 was 287,500.

Texas Oil Fields Tapped by New Phone Line.

Brownwood, Tex.—Telephone service between Brownwood and oil fields of North Brown county now is being given over new lines of the West Texas Telephone company. A new line between Breckenridge and Graham is contemplated.

Farm Telephone Statistics Show Iowa Leadership.

Des Moines, Ia.—Government statistics show Iowa leads in number of farm telephones with a percentage of 86.1. having 183,852 farm telephones. South Carolina holds the cellar championship with 5.7 per cent, having 10,943 rural telephones.

Omaha Makes First Cutover to Machine Switching.

Omaha, Neb.—In cutting over the Atlantic exchange to machine switching Omaha wins the honor of being the first city to have the new type of full mechanical, power-driven, multi-office equipment intended for wide adoption by Bell companies.

One Way to Reduce The Cost of Doing Business

A big bank in New York City says delays in turnover cost American Business $11,500,000 for interest each day of 1920. This charge was imposed by delays in shipments, delays in collections and the cost of capital invested in excessive stocks and slow moving goods on dealers' shelves.

There is going to be an interest bill for each day of 1922.

But—

It is within the power of each buyer of outside plant material to limit his contribution to this bill. He can hold down his investment by using our stocks for his reserve. His interest charges will be less and his turnover of working capital will be faster.

Everything for the outside plant, poles, crossarms, insulators, pole line hardware, etc., can be obtained quickly from the complete stocks of standard goods at our nearby Distributing House. There are 48 of these Houses located in centers of trade and transportation throughout these United States.

Their stocks and locations can assist every buyer to obtain maximum turnover with minimum investment of working capital whether he buys for his own use or for resale.

A National Electrical Service

Western Electric Company

OFFICES IN ALL PRINCIPAL CITIES

WINS FIRST ROUND.

Fort Wayne's Plea for Release From Rate Restriction is Justified Says Master.

Indianapolis, Ind.—Rates ordered by the Indiana commission to be granted by the Home Telephone and Telegraph company of Fort Wayne are confiscatory, according to Master of Chancery Charles Martindale in an opinion filed in Judge Anderson's court recommmending the Home utility be given an injunction prohibiting the commission from enforcing its rate order.

The significant first round victory was featured further by the master's statement that the telephone company was warranted in charging rates which will provide a reasonable return upon the fair value of the property, which was set as eight per cent.

This case is being watched with intense interest by telephone companies in Indiana and all other states, as it is the first instance of an Indiana company applying for an injunction against the commission's rate rulings. In the master's recommendation to Judge Anderson reference was made to the allowance of income tax as operating expense, the correct rate of depreciation, increased cost per station as the exchange grows, frequent publication of directories, and other subjects prominently before telephone men.

In the master's statement he paints a dismal picture of the stumbling future of a company that is compelled to struggle under the ever increasing burden of inadequate rates, and on the other hand presents the construction and better service program outlined by general manager Frank E. Bohn, if rates which afford investment attraction are allowed. As the court can not fix a rate, the master states, the plaintiff should be permitted to charge the rates prayed for, under a bond to guarantee the return to subscribers excess above rates which may be established by the commission as allowing a reasonable return on the property.

It is expected an injunction in accordance with the recommendations of the master will be granted,

Super-Service Board Has a "Coming-Out" Party.

Chicago, Ill.—"One of the season's most popular debutantes", as the society editors say, received at the Hotel Sherman exhibit of independent telephone equipment. This was the Stromberg - Carlson Super - Service switchboard. For the first time convention visitors had an opportunity of studying a board with so many features of speed and accuracy, says the Stromberg-Carlson publicity department. The board has comparatively few keys. The only keys required for an operator's position are the four buttons to control harmonic ringing, the emergency ringing key, reverting call key, and a group of order wire keys.

Here the Stromberg-Carlson Super-Service Board made its Debut.

Wisconsin Convention at Milwaukee February 14-16.

Milwaukee, Wis.—The annual convention of the Wisconsin State Telephone association will be held at the Republican House, Milwaukee, February 14-16. The program is to give special attention to problems of small telephone companies. It is planned to have one full day devoted to a discussion of "How can smaller telephone companies of the state secure uniform supervision of construction and maintenance work," and "Problems relating to telephone traffic."

Farmers' Buys Plymouth Company and Merges in Illinois.

Plymouth, Ill. — Farmers' Telephone company has purchased the Plymouth Mutual Telephone company and will consolidate the two exchanges.

Oakwood, Okla., Company Incorporated for $7,000.

Oakwood, Okla. — I. L. McCarty, Howard Titus, C. H. Wiley have incorporated the Oakwood Telephone company with a capital of $7,000.

Lack of Dollar Kept Methusaleh From Being Utility Magnate.

Washington, D. C. — Joe McCoy, government actuary has figured that if Methusaleh had invested $1 in a telephone company when he was 21 years old, at six per cent interest, and compounded his money annually, he would have been worth $977,157,900,000,000,000,000 when he died at the ripe old age of 969.

Kansas Mutual Meeting Slated For January 17-18.

Herington, Kan.—Mutual and cooperative telephone companies of Kansas will meet here January 17th and 18th. The many company representatives who are expected to be in attendance will make plans for assuring full grants of long distance service.

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